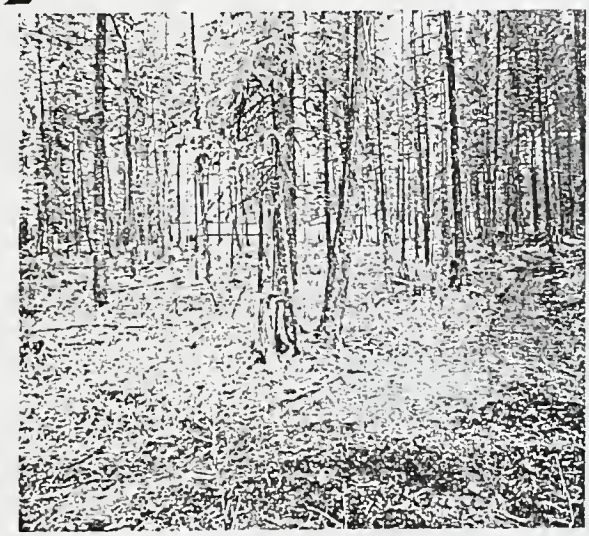
Happy Valley Timber Sale Project



Portions of Section 29, T30N, R21W; Sections 31,32, T31N, R21W
Flathead County

Checklist Environmental Assessment and Appendices
January 2004

Department of Natural Resources and Conservation
Kalispell Unit

CHECKLIST ENVIRONMENTAL ASSESSMENT

Project Name:	Happy Valley Timber Sale
Proposed Implementation Date:	Summer/Fall 2004
Proponent:	Kalispell Unit, Montana Department of Natural Resources and Conservation (DNRC)
Location:	SW 1/4 , E ½ SE ¼ Section 29, T30N, R21W – 240 acres owned for ACB trust Lots 1, 2, Section 31, T31N, R21W - 41.31 owned for SNS trust NW ¼ NE ¼ , NW ¼ Section 32, T31N, R21W – 200 acres owned for SNS trust
County:	Flathead

I. TYPE AND PURPOSE OF ACTION

The Kalispell Unit proposes to sell and harvest approximately 3 million board feet from the above listed state owned lands. Activities would include 2 harvest units totaling 443 acres; use of existing roads and abandonment of approximately 2 miles of road; fire hazard reduction treatments within the harvest units; and planting western larch and ponderosa pine seedlings on 100 acres or less. Section 77-1-202, Montana Code Annotated (MCA) requires the Board of Land Commissioners and DNRC to administer trust lands for generating revenue for the trusts' benefit. Under Section 77-5-223, MCA the DNRC administered state timber sale program is required to offer for sell 40 to 50 million board feet of timber statewide. The proposed Happy Valley timber sale would assist in achieving the above mandated objectives. Site specific objectives for the project area are: maintain or restore forest health; promote historic forest stand conditions and species compositions; and reduce fuels in stands adjacent to residential property.

II. PROJECT DEVELOPMENT

1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED:

Provide a brief chronology of the scoping and ongoing involvement for this project.

In October/November 2002, legal notices were placed with these local newspapers - Daily Interlake, Hungry Horse News, and Whitefish Pilot. Scoping letters were sent to adjacent landowners and those interested parties on the Kalispell Unit mailing list for scoping notices. Response letters were sent to those commenting by letter. Those involved in project development from DNRC include: Gary Hadlock, road and logging engineer; Garrett Schairer & Norm Merz, wildlife biologists; Tony Nelson, soils & hydrology; Terry Thorpe, forester/project leader; Beverly O'Brien, unit forest management supervisor; and Greg Poncin, unit manager/decision maker. In October 2003 a newsletter was sent to adjacent landowners and interested parties informing them of the project status and more detail of the timber sale design. No additional comments or input have been received from outside the agency.

2. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:

Department of Environmental Quality: annual air quality permit for regulation & coordination of slash burning
Flathead County Road Department: an encroachment permit for requesting or performing application of road dust abatement on segments of the county road

3. ALTERNATIVES CONSIDERED:

During the scoping and project development phases, only the sale of forest products was identified as an immediate opportunity for generating revenue. As a result, two alternatives - the NO ACTION and ACTION were developed for this proposal and are described below.

1) NO ACTION: Harvesting and selling timber from 433 acres would not occur. Existing public uses of land and roads for recreation would continue. The western larch/Douglas-fir timber stands would

continue to develop without density or stocking control resulting in increasing amounts of Douglas-fir and decreasing amounts of western larch in the species composition.

2) ACTION ALTERNATIVE: This alternative includes actions associated with logging and harvesting approximately 3 MMBF of wood products from 433 acres. 160 acres would be treated with a modified seedtree cut, and 283 acres would be treated with a selection (individual and group) cut. Logging slash would be piled or trampled, with dozers or similar equipment. Piles would be burned. Special operating areas (SOA) would include the 43 acres within 200 feet of residential property. This area would have sub-merchantable trees removed at the time of logging to reduce the fire hazard associated with ladder fuels. Slash disposal would remove 90% or more of the slash in the SOA. Spot planting of western larch and ponderosa pine would occur within larger openings on 100 acres or less. Existing roads and skid trails would be used for ground based skidding and hauling activities. Approximately 2 miles of existing road would be abandoned and rehabilitated after harvest activities are completed. Motorized use would be restricted on all remaining roads after sale completion.

III. IMPACTS ON THE PHYSICAL ENVIRONMENT

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:

Consider the presence of fragile, compactable or unstable soils. Identify unusual geologic features. Specify any special reclamation considerations. Identify any cumulative impacts to soils.

Soils in the project area are classified in the Whitefish Series. These consist of glacial till with a volcanic ash-influenced loess surface soil. These soils can be compacted when wet and displacement of surface soil can reduce soil productivity. No fragile, high risk soils are present. Terrain is gently sloped and no slope failure areas were identified. Effects from the action alternative would be minimized by restricting ground based equipment activity to times when soil is dry, frozen, or snow covered; reuse of existing skid trails and roads; and closure or rehabilitation of excess roads. Refer to topographic map in Appendix A and Soils report in Appendix B for more detail.

5. WATER QUALITY, QUANTITY AND DISTRIBUTION:

Identify important surface or groundwater resources. Consider the potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality. Identify cumulative effects to water resources.

There are no beneficial surface water uses in the area. The class 3 stream on site becomes sub-surface and does not contribute flow to another body of water. The stream channel is stable and well vegetated. There is some sediment delivery to this stream from the existing road and trail system. Under the action alternative, effects from increased water yield following timber harvest would be minimal due to the discontinuous, stable stream channel and well drained soils in the area. The 50 feet Streamside Management Zone would further protect the stream bank and filtering capacity of adjacent vegetation. The action alternative would improve erosion control and surface drainage on existing roads, and result in closure or rehabilitation of excess roads reducing the current levels of erosion and sediment delivery. Refer to Hydrology report in Appendix C for more detail.

6. AIR QUALITY:

What pollutants or particulate would be produced? Identify air quality regulations or zones (e.g. Class I air shed) the project would influence. Identify cumulative effects to air quality.

The project area is within a Class II air shed and the Kalispell Impact Zone. The action alternative would increase the amount of road dust from logging traffic and smoke from prescribed burning of logging slash. Increases in smoke and dust would be short term and intermittent. Road dust abatement may be required to

control quantity of dust if operations are active during droughty conditions. Any burning would be accomplished in accordance with State Air Quality regulations.

7. VEGETATION COVER, QUANTITY AND QUALITY:

What changes would the action cause to vegetative communities? Consider rare plants or cover types that would be affected. Identify cumulative effects to vegetation.

No rare plants or cover types were identified within the project area. The existing Douglas-fir/western larch forest community would be maintained, although stand characteristics would be altered. 160 acres would be treated with a modified seedtree cut, and 283 acres would be treated with individual and group selection cut. Canopy closures, number of stems per acre, and proportion of Douglas –fir would be reduced. Existing timber stands do not meet the age and size criteria for old growth, and harvesting under the action alternative does not reduce the potential for old growth development in the long term. Reduced tree density would improve individual tree growth, promoting development of larger diameter trees in the future, and improving stand resistance to insect and disease. Snags are rare (0-1/acre) in the existing stands. The action alternative would leave snags or snag replacement trees (a minimum of 2/acre) on harvest acres that are more than 200 feet away from residential property or county roads. Refer to Appendix D, Vegetative report for more detail.

8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:

Consider substantial habitat values and use of the area by wildlife, birds or fish. Identify cumulative effects to fish and wildlife.

There are no fish bearing streams on site and flow from the project area does not contribute to any fish bearing streams. The closed canopy stands currently provide 359 acres of habitat for "forest interior" species. Harvesting would reduce tree density and open up the tree canopy, providing 359 acres of habitat favorable to wildlife species preferring more open habitats. These open habitats were more prevalent historically, under natural disturbance regimes. The project area is part of a big game winter range (0.4% of larger winter range) and thermal cover would be reduced after harvest. Elk are not known to frequent the area, but white-tailed deer are present year round. Winter survival of white-tailed deer may be slightly reduced in the short term, in the case of a severe winter, prior to tree crown development and increasing canopy closure. The action alternative would retain pockets of dense vegetation for thermal cover/snow intercept within the harvest units, and reduce the amount of open roads traversing state owned land in the project area. Refer to Appendix W, Wildlife report for more detail.

9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:

Consider any federally listed threatened or endangered species or habitat identified in the project area. Determine effects to wetlands. Consider Sensitive Species or Species of special concern. Identify cumulative effects to these species and their habitat.

The existing environment does not provide favorable habitat for any federally listed threatened or endangered species. DNRC recognizes the pileated woodpecker as a sensitive species, and current timber stand conditions may provide foraging and low quality nesting habitat. The action alternative would reduce canopy closure; promote development of large diameter western larch; and retain snags or live trees for snag replacement. Due to the openness of the stands after harvest, nesting habitat suitability may be reduced. In the long term, pileated woodpecker habitat is expected to improve and be more sustainable as the canopy closes and western larch is retained as a proportion of the species composition –thus providing more favorable nesting sites in the future. Mitigation measures included in the action alternative include: favoring western larch for leave trees and for regeneration; restrict motorized access to protect snags and snag replacement trees from loss; leave snags, snag recruits, and coarse woody debris on site. Refer to Appendix W, Wildlife report for more detail.

10. HISTORICAL AND ARCHAEOLOGICAL SITES:

Identify and determine effects to historical, archaeological or paleontological resources.

A review of state cultural and historical resource records identified a lack of these resources in the project area. No further investigation or survey was required due to the lack of discovery of any of these resources during past management activities.

11. AESTHETICS:

Determine if the project is located on a prominent topographic feature, or may be visible from populated or scenic areas. What level of noise, light or visual change would be produced? Identify cumulative effects to aesthetics.

The project area is bordered on three sides by residential subdivision. Homes located along the boundary have a direct view into the project area. To create a zone of fuel reduction, a Special Operating Area (SOA) is proposed adjacent to the residential development. Within the SOA, retention trees will be spaced approximately 40 feet apart. In the balance of the project area, trees will be left in a random fashion, and advanced regeneration and pole-sized trees will be protected. The proposed harvest would result in a more open timber stand, maintaining some structural diversity outside the SOA.

12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:

Determine the amount of limited resources the project would require. Identify other activities nearby that the project would affect. Identify cumulative effects to environmental resources.

None

13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:

List other studies, plans or projects on this tract. Determine cumulative impacts likely to occur as a result of current private, state or federal actions in the analysis area, and from future proposed state actions in the analysis area that are under MEPA review (scoped) or permitting review by any state agency.

The project area is included with other state owned lands that fall near or within the city of Whitefish's planning jurisdiction. DNRC initiated a Whitefish Planning Area Study for these state owned lands in 2002. Upon completion of this plan, DNRC will have identified new land use opportunities for generating revenue, that are compatible with local community growth and development. These new uses may be in addition to the current, traditional timber or agricultural uses, or replace the current land uses. The proposed timber harvest in the action alternative would not eliminate any potential land use opportunities from occurring on this site.

IV. IMPACTS ON THE HUMAN POPULATION

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

14. HUMAN HEALTH AND SAFETY:

Identify any health and safety risks posed by the project.

Safety risks for recreational users of the parcel would be increased during harvest operations. Signs limiting or curtailing use during the period of harvest would be posted to warn the public of the dangers and of the limitations imposed on use. Recreational use would be curtailed again when the residues resulting from harvest activities are machine piled and burned. Short- term health hazards would exist during harvest activities from dust and from smoke resulting from burning of slash piles. Dust would be controlled by a combination of applying dust abatement to portions of haul roads and by limiting speeds of logging traffic. Burning would occur during periods of good ventilation to minimize the amount of smoke remaining in the area.

15. INDUSTRIAL, COMMERCIAL AND AGRICULTURE ACTIVITIES AND PRODUCTION:

Identify how the project would add to or alter these activities.

Commercial logging would occur on 433 acres of state owned land over a 2 – 3 year period. This activity has potential to occur on adjacent private lands within the same time period.

16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:

Estimate the number of jobs the project would create, move or eliminate. Identify cumulative effects to the employment market.

People are currently employed in the wood products industry in the region. Due to the relatively small size of the timber sale program, there will be no measurable cumulative impact from this proposed action on employment.

17. LOCAL AND STATE TAX BASE AND TAX REVENUES:

Estimate tax revenue the project would create or eliminate. Identify cumulative effects to taxes and revenue.

People are currently paying taxes from the wood products industry in the region. Due to the relatively small size of the timber sale program, there will be no measurable cumulative impact from this proposed action on tax revenues.

18. DEMAND FOR GOVERNMENT SERVICES:

Estimate increases in traffic and changes to traffic patterns. What changes would be needed to fire protection, police, schools, etc.? Identify cumulative effects of this and other projects on government services

There will be no measurable cumulative impacts related to demand for government services due to the relatively small size of the timber sale program, the short-term impacts to traffic, the small possibility of a few people temporarily relocating to the area, and the lack of large timber sales in the adjacent area.

19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:

List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.

In June 1996, DNRC began a phased in implementation of the State Forest Land Management Plan (Plan). The management direction provided in the Plan comprises the framework within which the 2003 State Forest Land Management Rules (rules) were developed and adopted. *State forest land management rules 36.11.403 through 36.11.450, ARM apply to forest management activities on all forested state trust lands administered by* DNRC. The appropriate rules have been incorporated in the action alternative.

20. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:

Identify any wilderness or recreational areas nearby or access routes through this tract. Determine the effects of the project on recreational potential within the tract. Identify cumulative effects to recreational and wilderness activities.

The trust lands in this project area are used for general recreational use consisting mostly of day use activities such as, hiking, biking, ATV riding, Nordic skiing, and restricted hunting (refer to hunter opportunity section of Appendix W – Wildlife Report). The action alternative proposes closing many of the existing roads with water bars and slash, to reduce the amount of motorized use that is resulting in erosion and sediment delivery.

21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:

Estimate population changes and additional housing the project would require. Identify cumulative effects to population and housing.

There will be no measurable cumulative impacts related to population and housing due to relatively small size of the timber sale program, and the fact that people are already employed in this occupation in the region.

22. SOCIAL STRUCTURES AND MORES:

Identify potential disruption of native or traditional lifestyles or communities.

No disruption of the rural agricultural or rural residential lifestyle is anticipated.

23. CULTURAL UNIQUENESS AND DIVERSITY:

How would the action affect any unique quality of the area?

None.

24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:

Estimate the return to the trust. Include appropriate economic analysis. Identify potential future uses for the analysis area other than existing management. Identify cumulative economic and social effects likely to occur as a result of the proposed action.

The proposed timber sale would return approximately $450,000 to the trust based on the assumption that 3,000 MBF would be harvested for a stumpage value of $150/MBF. The potential exists for the residential development of the tract through leasing or sale. Residential development is speculative at this time and may be an additive revenue generating use to these lands or may be an exclusive future use. The proposed action would not detract from this future potential use.

EA Checklist Prepared By:	**Name:** Terry Thorpe;	**Date:** November 24, 2003
	Title: NWLO Small Sales and Forest Products Accountability Specialist	

V. FINDING

25. ALTERNATIVE SELECTED:

The interdisciplinary team has completed the Environmental Assessment for the Happy Valley Timber Sale. In the development of this EA 2 alternatives were considered, Action and No Action. These two alternatives were evaluated on their ability to meet the mandate of managing school trust lands to generate revenue for the trusts' benefit, and the more site specific objectives of maintaining and restoring forest health, promoting historic stand conditions and species composition, and reducing fuels in stands adjacent to residential property.

After a thorough review of the EA, project file, public correspondence, Department policies, standards, guidelines, I have selected the action alternative for implementation on this project.

I have selected the Action Alternative for implementation with the understanding that resource mitigation measures identified in the Environmental Assessment will be applied to meet the intended protection.

The Action Alternative has been selected for the following reasons:

1) The Action Alternative meets the Purpose of Action and the specific project objectives listed on page 1 of the EA.
2) DNRC is required to administer these lands to produce the largest measure of reasonable and legitimate long-term return for beneficiaries *(Montana Codes Annotated 77-1-202)*. DNRC meets this obligation by managing intensively for healthy and biologically diverse forests.
3) The Action Alternative includes adjustments, mitigations, and activities to address concerns expressed by the public and others, including, but not limited to:
    a) Potential adverse effects of harvest on avian species in the project area will be mitigated by favoring western larch for leave trees (snag recruitment), restricting motorized access to protect snags and snag replacements from loss, and leaving snags, and course woody debris on site.
    b) Road dust was also identified as a concern, and while this would be short term and intermittent, dust abatement may be used to mitigate this impact if necessary.
    c) Concerns over the specifications in the silvicultural prescription will be addressed by tailoring prescriptions to result in conditions similar to the areas harvested under the Flathead Forestry Project, and the Happy valley Fuels Management Project.
    d) Some existing roads within the project area will be closed to motorized traffic for resource protection reasons. DNRC will make efforts to keep access open for general recreation as defined in "Rules for Recreational Use of State Land" where possible.

26. SIGNIFICANCE OF POTENTIAL IMPACTS:

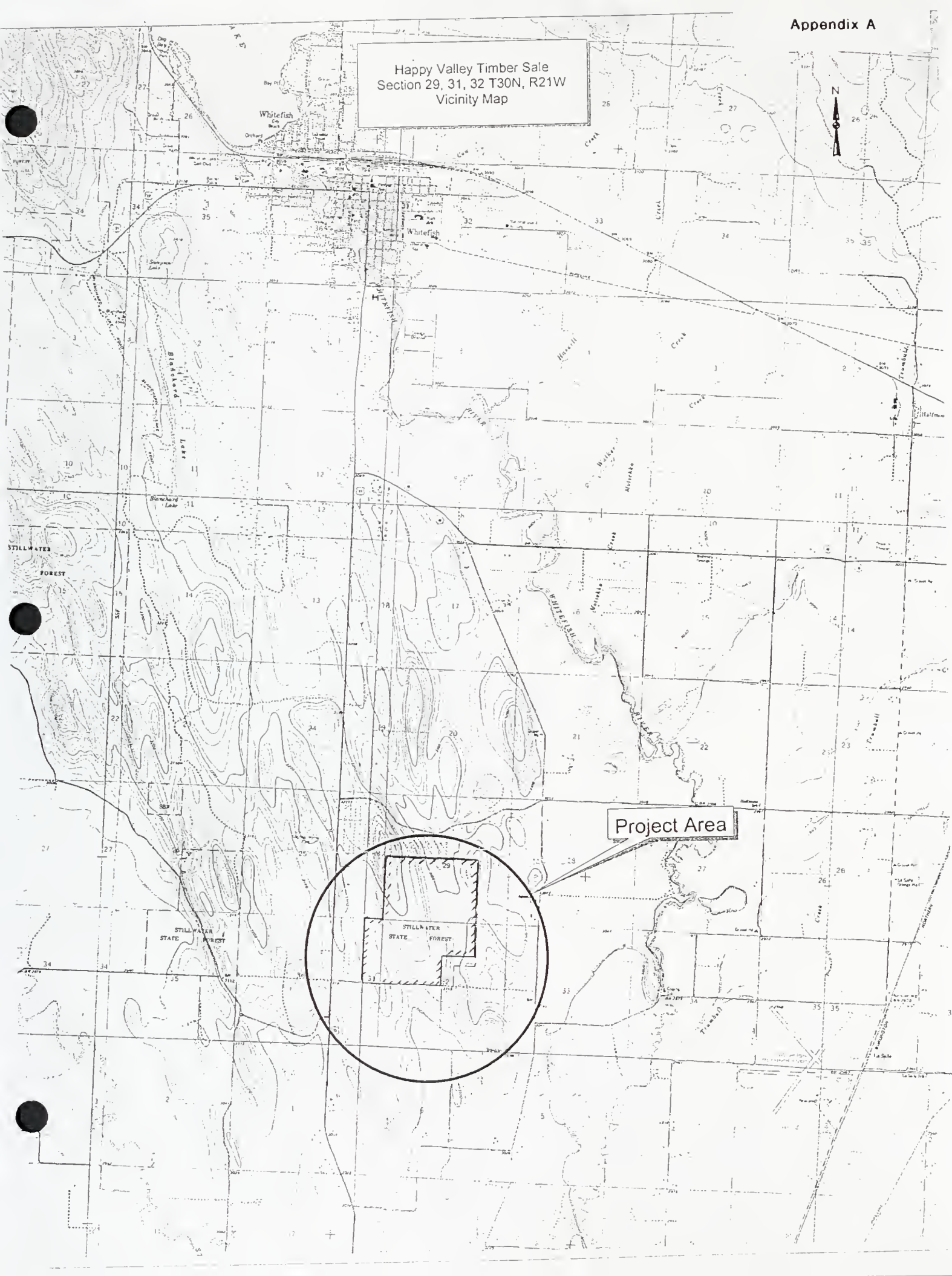
I find that none of the project impacts are regarded as severe, enduring, geographically widespread, or frequent. Further, I find that the quantity and quality of the natural resources, including any that may be considered unique or fragile, will not be adversely affected to a significant degree. I find no precedent for future actions that would cause significant impacts, and I find no conflict with local, State, or Federal laws, requirements, or formal plans. In summary, I find that adverse impacts will be avoided, controlled, or mitigated by the design of the project to an extent that they are not significant.

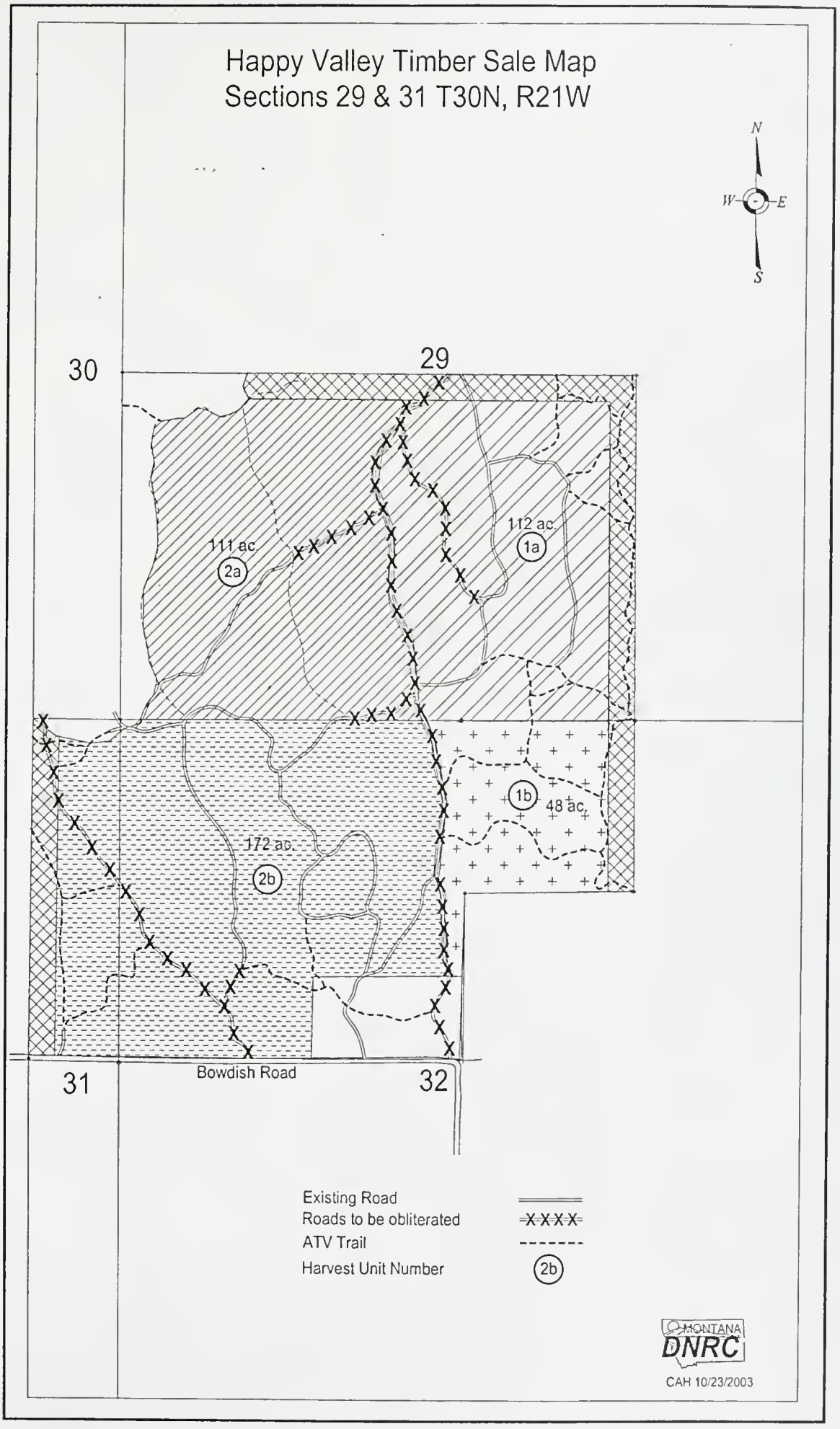
27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

[ ]	EIS	[ ]	More Detailed EA	[X]	No Further Analysis

EA Checklist Approved By:	**Name:**	Greg Poncin
	Title:	Kalispell Unit Manager
Signature:		**Date:** January 9, 2004

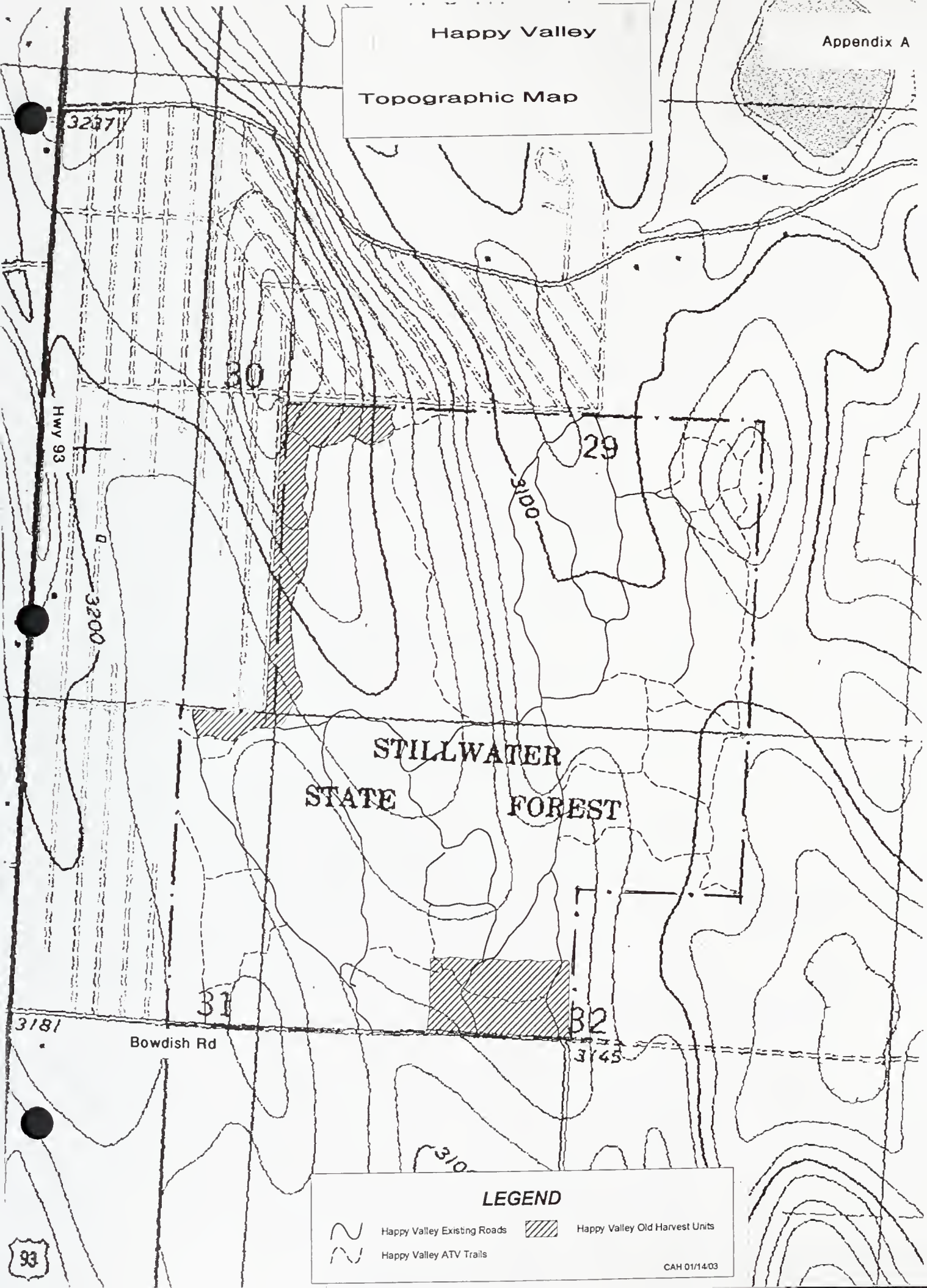
Appendix A


Happy Valley Timber Sale
Section 29, 31, 32 T30N, R21W
Vicinity Map
N
Project Area
Whitefish
STILLWATER
FOREST
STILLWATER STATE FOREST

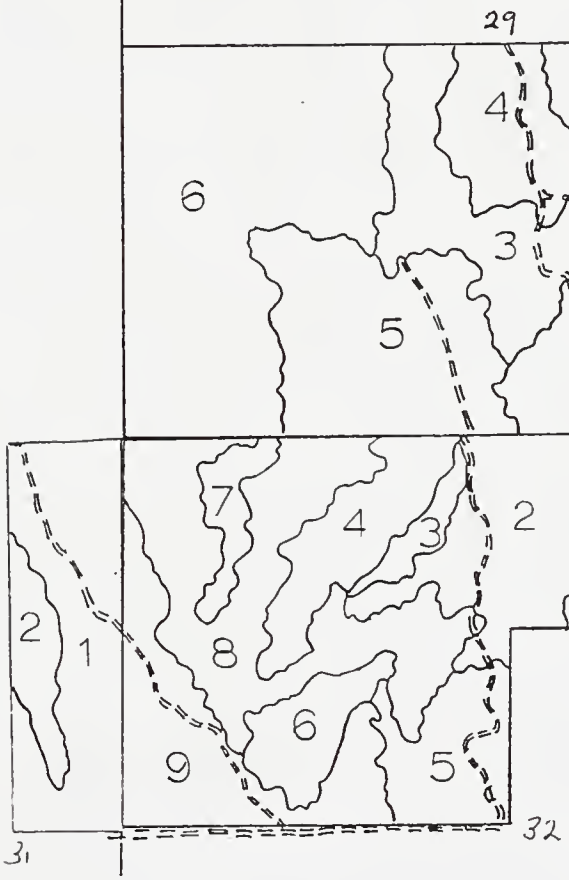

Happy Valley Timber Sale Map
Sections 29 & 31 T30N, R21W
N
W
E
S
30
29
111 ac.
2a
112 ac.
1a
1b
48 ac.
172 ac.
2b
31
Bowdish Road
32
Existing Road
Roads to be obliterated
ATV Trail
Harvest Unit Number
2b
MONTANA
DNRC
CAH 10/23/2003

Happy Valley

Topographic Map



HAPPY VALLEY STAND MAP



Sec. 29

Std #	Type	Area
01	DL9WM	11.7
02	DL9WM	23.0
03	DL9WM	54.6
04	DL9WM	19.5
05	DL9WM	42.4
06	DL9WM	86.5
50	R	2.3
	Total:	240.0

Sec. 31

Std #	Type	Area
01	DL9WM	32.4
02	NF	8.2
50	R	0.7
	Total:	41.3

Sec. 32

Std #	Type	Area
01	D9WM	16.0
02	DL9WM	38.7
03	DL9WM	5.4
04	DL9WM	17.4
05	D9WM	17.2
06	DL9WM	11.0
07	DL9WM	6.3
08	DL9WM	54.2
09	DL9WM	31.6
50	R	2.2
	Total:	200.0

SOILS ANALYSIS FOR THE HAPPY VALLEY TIMBER SALE

INTRODUCTION

The upper Flathead valley is formed by glacial scour. The dominant soil types found in the project area consist of glacial till with a volcanic ash-influenced loess surface soil. Geology is derived from argillite, siltite and limestone from the Belt Supergroup.

ANALYSIS METHODS

Soil productivity will be analyzed by evaluating the current levels of soil disturbance in the proposed project area. Analysis criteria will also include soil stability risk factors.

ANALYSIS AREA

The analysis area for evaluating soil productivity will include DNRC owned land within the proposed project area.

EXISTING CONDITIONS

In the proposed project area, DNRC has conducted timber harvesting since the 1920s. Since that time, nearly all of the state land in the proposed project area has been harvested with varying intensity. All harvesting has used ground based machinery. Ground based yarding affects soil productivity through displacement and compaction of productive surface layers of soil. Proper spacing of skid trails and season of use restrictions are the most effective methods to minimize the loss of productivity. Many of the skid trails in old harvest units have adequate spacing, but some have not re-vegetated well. The primary reason for the poor re-vegetation is due to use of motorized vehicles on trails. Use on some of the old trails has been extensive enough that they have become part of the existing road system.

Erosion and rutting on the existing road system is severe in places, and the existing road system does not meet applicable BMPs in many places.

Soil types in the project area are classified in the Whitefish Series, and vary from nearly level to gently rolling. Primary management concerns with these soils are to minimize compaction and displacement. Surface soil productivity can be reduced with compaction and displacement if not properly mitigated and minimized. No areas of high risk soil were identified in the project area by the Upper Flathead Valley Soil Survey. No slope failures were identified during reconnaissance in this area.

DIRECT AND INDIRECT EFFECTS

No Action Alternative

The no action alternative would have no direct effects on soil productivity. No ground based machinery would be operated under this alternative, which would leave the soil in the project area unchanged from the existing conditions.

Action Alternative
The action alternative would have direct impacts on approximately 443 acres of ground, all of which has been harvested in the past. Direct impacts would include compaction and displacement resulting from use of ground based equipment to skid logs, pile slash, and prepare the site for regeneration on approximately 443 acres. Activity would be completed when soil moisture is at or below 20%, frozen or snow-covered. These impacts would leave approximately 15% of the proposed harvest units in an impacted condition. Disturbance levels may be lower if the proposed salvage activity were conducted over frozen or snow-covered conditions.

The action alternative would also improve the erosion control and surface drainage on 6.6 miles of existing road, and bring it up to applicable BMP standards for the duration of activity. Portions of the existing road system in the proposed project area would be rehabilitated and made impassible by motorized traffic. Some portions of the existing road and trail system would be left open for seasonal ATV use, and for fire suppression access. Abandoned roads would have erosion control features installed and be left in a condition where future maintenance would not be needed. Portions of trails left passable by ATVs and fire suppression vehicles would have seasonal use restrictions to minimize the potential for erosion and sediment delivery. These activities would reduce the erosion and rutting from the current levels, and would improve soil productivity in the proposed project area.

TABLE 3-1 – SUMMARY OF DIRECT EFFECTS OF ALTERNATIVES ON SOILS

Description of Parameter	No Action Alternative[1]	Action Alternative
Acres of Harvest	0	443
Acres of tractor yarding	0	443
Acres of skid trails and landings[2]	0	89
Acres of moderate impacts[3]	0	67
Percent of harvest area with impacts	0%	15.1%

[1] Does not include effects from past harvesting, only impacts generated by alternative for comparison between alternatives
[2] 20 percent of ground based area
[3] 75 percent of ground-based skid trails

CUMULATIVE EFFECTS

No Action Alternative
This alternative would have no cumulative impacts on soil productivity. No soil would be disturbed under this alternative, and no re-entry of past harvest units would occur with the no action alternative.

Action Alternative
The action alternative would enter old harvest units. Existing skid trails from past timber sales and salvage activities would be used if they are properly located and spaced. Use of existing skid trails would minimize the risk of cumulative impacts to soil productivity.

Based on evaluations of the proposed project area, most existing skid trails are located well, and properly spaced; so additional skid trails and subsequent cumulative soil impacts would be minimal.

WATERSHED AND HYDROLOGY ANALYSIS FOR THE HAPPY VALLEY TIMBER SALE

INTRODUCTION

Water Quality

The primary parameter of concern for water quality is sediment. Increased sediment delivery and deposition can affect physical and biological water quality, channel stability and geomorphology. Sediment yield can be affected by a number of activities. Timber harvesting and associated road construction can increase sediment yield through exposure of bare soil. These impacts can be mitigated through implementation of Best Management Practices (BMPs), and other erosion control measures.

Water Yield

Timber harvesting and associated activities can affect the timing, distribution, and amount of water yield in a harvested watershed. Similarly, effects of stand replacement wildfire also affect water quantity and yield in a watershed. Water yields increase proportionately to the percentage of canopy removal, because removal of live trees reduces the amount of water transpired, leaving more water available for soil saturation and runoff. Canopy removal also decreases interception of rain and snow and alters snowpack distribution and snowmelt, which lead to further water yield increases. Higher water yields may lead to increases in peak flows and peak-flow duration, which can result in accelerated streambank erosion and sediment deposition.

ANALYSIS METHODS

Existing conditions for water quality and water yield were analyzed using field site visits and visual inspection of the drainage features in the proposed project area.

ANALYSIS AREA

Water Quality

The analysis area for water quality is the proposed project area, and all forest roads that lead into the project area from other ownership. The primary focus of the sediment delivery analysis was on the first order discontinuous stream and ephemeral draws located within the proposed project area.

Water Yield

The analysis area for water yield is the first order discontinuous stream running through the project area.

EXISTING CONDITIONS

Regulatory Framework

Montana Surface Water Quality Standards: According to ARM 17.30.608 (1)(d), the Whitefish River drainage and its tributaries are all classified as B-2. Among other criteria for B-2 waters, no increases are allowed above naturally occurring levels of sediment, and moderate increases are allowed over naturally occurring turbidity. "Naturally occurring," as defined by ARM 17.30.602 (17), includes conditions or materials present during runoff from developed land where all reasonable land, soil and water conservation practices (commonly called BMPs) have been applied. Reasonable practices include methods, measures or practices that protect present and reasonably anticipated beneficial uses. These practices include but are not limited to structural and non-structural controls and operation and maintenance procedures. Appropriate practices may be applied before, during, or after completion of activities that may impact the resource.

There are no designated beneficial surface water uses within the project area due to a lack of stream channels or delivery to downstream waters.

Water Quality Limited Waterbodies: The proposed project area is located within the Whitefish River watershed. The Whitefish River is listed in the 1996 and 2002 List of Waterbodies in Need of Total Maximum Daily Load (TMDL) Development publication produced by the Montana Department of Environmental Quality (DEQ, 1996, 2002). The stream and draws found within the project area are discontinuous and do not contribute surface flow to the Whitefish River.

Montana Streamside Management Zone (SMZ) Law: By the definition in ARM 36.11.312(4)(b), the discontinuous drainage feature running north to south through the proposed project area is a class 3 stream. The stream has a defined channel, flows water for less than 6 months of the year, but becomes sub-surface downstream from the project area and does not contribute flow to another body of water.

Water Quality

The class 3 stream that flows through the project area appears to be primarily the result of runoff from residential home and road construction to the north of the proposed project area. Ditches constructed to channel road runoff and overland runoff from these residential areas deliver the surface runoff to the stream found within the proposed project area. The flow from this runoff is the source of surface flow in the channel, and may be what caused the channel formation to occur. The stream is low gradient, stable, well vegetated with grass and sedges, and is not actively eroding or down-cutting. No in-channel sources of sediment were identified during field reconnaissance.

The existing road system in the proposed project area is low standard, and does not currently meet best management practices for surface drainage or erosion control. Some portions of the road system are poorly located in draw bottoms. These conditions have created erosion problems within the road system. In places, this erosion has been severe. Many reaches of road are badly rutted, and are used by all-terrain vehicles and four wheel drive vehicles for "mud bogging". This has led to severe erosion problems in places. A majority of this erosion remains

on-site and is not delivered to a stream or draw, but there is delivery to the stream in places. No other sources of erosion or deposition were identified through field review.

Water Yield

Past activities in and around the proposed project area include timber management, agriculture, and home site development. These activities have led to reductions in forest canopy cover, and construction of roads.

Following field reconnaissance of the proposed project area, it was determined that a detailed water yield analysis would not be necessary for the proposed project area. The stream running through the project area becomes subsurface just below the project area, and areas between the project area and the Whitefish River have no current or historic stream or draw features that would deliver surface water. As a result, water yield increases from past activities have not been sufficient to create an ephemeral draw or channel beyond the immediate project area; or to deliver surface flow to downstream waters.

DIRECT AND INDIRECT EFFECTS

No Action Alternative

Direct and indirect effects of the no action alternative would be similar to the conditions described under the existing conditions for water quality and water yield. The water quality and water yield would be unaffected by the no action alternative, and the stream and ephemeral draws in the proposed project area would continue to be affected by natural and pre-existing conditions.

Action Alternative

The proposed action alternative would harvest timber from approximately 443 acres. No measurable impacts to water yield are anticipated from the proposed harvesting for the following reasons: 1) The selective nature of the harvest over most of the proposed project area would leave substantial amounts of live trees on the site, and is designed to allow more rapid growth of remaining trees, 2) The well-drained nature of the soils would produce little or no detectable change in water yield, 3) The class 3 stream and ephemeral draws within the project area are stable and vegetated with a dense mat of grass and forb vegetation, making them capable of handling potential water yield increases without destabilizing, and 4) A 50 foot Streamside Management Zone on both sides of the discontinous stream would protect the streambank and adjacent vegetation.

The action alternative would also improve the erosion control and surface drainage on 6.6 miles of existing road, and bring it up to applicable BMP standards for the duration of activity. Portions of the existing road system in the proposed project area would be rehabilitated and made impassible by motorized traffic. Some portions of the existing road and trail system would be left open for seasonal ATV use, and for fire suppression access. Abandoned roads would have erosion control features installed and be left in a condition where future maintenance would not be needed. Portions of trails left passable by ATVs and fire suppression vehicles would have seasonal use restrictions to minimize the potential for erosion and sediment delivery. These

activities would reduce the erosion and sediment delivery rates from the current levels, and would improve water quality in the proposed project area.

Cumulative Effects

No Action Alternative
Cumulative effects of the no action alternative on water quality and water yield would be similar to the situations described in the existing conditions. The water quality and water yield would be unaffected by the no action alternative, and the stream and ephemeral draws in the proposed project area would continue to be affected by natural and pre-existing conditions.

Action Alternative
Risk of sediment delivery in the proposed project area would be reduced from current levels. Decommissioning of existing poorly located roads would reduce erosion rates and lower the risk of sediment delivery to other areas.

Past activity in and around the proposed project area has mainly consisted of residential home construction and agricultural use, with some areas being managed for timber production. On sites where timber was harvested, there has been substantial vegetative and hydrologic recovery with no apparent impact on water yield increases.

The proposal is to selectively harvest the stand by commercial thinning, shelterwood, and seed tree prescriptions. Watershed cumulative effects are not anticipated for the following reasons: 1) The selective nature of the harvest over most of the proposed project area would leave substantial amounts of live trees on the site, and is designed to allow more rapid growth of the remaining trees, 2) The well-drained nature of the soils would produce little or no detectable change in water yield, 4) The stream and ephemeral draws within the project area are stable and vegetated with a dense mat of grass and forb vegetation, making them capable of handling potential water yield increases without destabilizing, and 5) All of the proposed harvesting would occur in an intermittent drainage with no surface delivery to another body of water, therefore potential increases in sediment or water yield from harvest activities would not affect downstream waters.

APPENDIX D: VEGETATIVE ANALYSIS for Happy Valley Timber Sale Proposal

A. Existing Forest Conditions

The State Forest Land Management Rule 36.11.404 directs DNRC to promote biodiversity by taking a coarse filter approach thereby favoring an appropriate mix of stand structures and compositions on State land. Components used to determine an appropriate mix of stand conditions at the landscape level are based on ecological characteristics. Forests in the project area are described using the following characteristics: cover type proportions, age class distributions, stand structural characteristics, species composition, and the spatial relationships of stands - i.e. size and location on the landscape.

1. Kalispell Unit (landscape level) Cover Types

Estimates of current and appropriate cover types were determined at the Landscape Level for the entire Kalispell Unit in 1999. The Kalispell Unit's Stand Level Inventory (SLI) was used in conjunction with John Losensky's 1997 report *Historical Vegetation of Montana* to compare present (current) conditions with historical (appropriate) conditions for this landscape in regards to amount and distribution of cover types. Table 1 displays this information.

Table 1: Current and Appropriate Cover Types for the Kalispell Unit

Cover Type	Current Cover Type (Acres)	Appropriate Cover Type (Acres)	Current Type Minus (-) Appropriate Type (Acres)
ALP	1918.5	233.2	1685.3
DF	1384.0	1873.9	(489.9)
LP	2079.1	1605.0	474.1
MC	12050.8	3053.5	8997.3
PP	12739.2	12713.0	26.2
WL/DF	26129.6	36852.1	(10722.5)
WWP	2429.5	2503.5	(74.0)
OTHER	5428.2	5324.7	103.5
TOTAL	64158.9	64158.9	

ALP = Alpine fir. DF = Douglas-fir. LP = Lodgepole pine. MC = Mixed conifer. PP = Ponderosa pine. WL/DF = Western larch/ Douglas-fir. WWP = Western white pine. Other = non stocked lands, nonforest, or hardwood forests. The Current Type minus Appropriate Type column above lists the excess and deficit (-) acres for each Cover Type.

The DF, WL/DF, and WWP cover types are not as well represented within the Kalispell Landscape as estimated for the early 1900's. Most notable, is the conversion of almost 11,000 acres in the WL/DF cover type, over the last 100 years, to the present over abundance of the MC and ALP cover types by approximately 12,000 acres.

This cover type shift is not atypical for Northwest Montana, but it does represent a change in stand conditions. Active fire suppression initiated in the early 1900's has interrupted wildfire frequencies and intensities in conjunction with 50 years or more of logging practices that favored the removal of commercially valuable western larch (*Larix occidentalis)*, ponderosa pine (*Pinus ponderosa)*, western white pine (*Pinus monticola)* and Douglas-fir (*Pseudotsuga menziesii)* for railroad ties, mining timbers, and construction lumber. Many open, mature stands dominated by western larch and other seral species with even-aged patches of immature seral trees in the understory have been replaced with more densely stocked stands in both the overstory and understory that includes a higher percentage of more shade tolerant trees such as, grand fir (*Abies grandis*), spruce (*Picea spp.*) and Douglas-fir.

2. Happy Valley (project area) Cover Types

The Happy Valley project area comprises 481 acres (<1%) of the Kalispell Unit landscape. Stand level inventory (SLI) data specific to the project area in Sections 29, 31, and 32 T30N R21W is summarized below for cover types and age class distribution. Site review observations and stand measurements were used to update, confirm or refine the SLI data.

Table 2 displays current and appropriate cover types for the Happy Valley project area. Current cover type on the project area is the same as the appropriate cover type.

Table 2: Current and Appropriate Cover Types for the Happy Valley parcel (Sections 29, 31, & 32 T30N, R21W)

Cover Type	Current Cover Type (Acres)	Appropriate Cover Type (Acres)	Current Type Minus (-) Appropriate Type (Acres)
WL/DF	467.9	467.9	0
OTHER	13.4	13.4	0
TOTAL	481.3	481.3	

DF = Douglas-fir. WL/DF = Western larch/ Douglas-fir. Other = non stocked lands, nonforest, or hardwood forests. The Current Type minus Appropriate Type column above lists the excess and deficit (-) acres for each Cover Type.

3. Happy Valley Stand History

The Happy Valley parcel is composed of portions of Sections 29, 31, and 32. The harvest history on the parcel dates back to 1921, which is as far back as the State has records. Permits for forest products, i.e. posts, poles, houselogs, ties, piling, cordwood, and Christmas trees date from 1921 to the present. Over this time, significant quantities of these products have been removed from the parcel. Sawlog salvage permits have also been issued from 1927 until the present for salvage of approximately 175 MBF. In 1924 and 1925 the first major timber sale occurred on the parcel. Approximately 3181 MBF, the majority of which was PP, was harvested from the parcel. Then in 1972, another timber sale removed approximately 1140 MBF of DF and WL. In 1997 the Flathead Forestry Project harvested 20 acres adjacent to Bowdish Road. In 2000 the Happy Valley Fuels Reduction project harvested 25 acres adjacent to the Happy Valley subdivision

4. Kalispell Unit (landscape level) Age Class Distribution

The Kalispell Unit's Stand Level Inventory (SLI) 2001 version "kalsli" was used to summarize the estimated age class distribution for current cover types. Table 3 displays this information.

Table 3: Kalispell Unit Age Class Distribution by Current Cover Type

Summary of Acres in Age Class Groups (years):						
Cover Type:	00 - 39	40- 99	100 - 149	150+	Non Forest	Total
ALP	396.7	506.4	412.1	603.3		1918.5
DF	32.1	266.1	706.1	379.7		1384.0
LP	672.8	1149.8	256.5			2079.1
MC	974.6	3768.7	4488.0	2819.5		12050.8
PP	1013.4	5021.7	4847.1	1857		12739.2
WL/DF	957.0	8025.4	11450.8	5696.4		26129.6
WWP	360.0	210.0	1317.1	542.4		2429.5
OTHER	113.0	207.4	42.4		5065.4	5428.2
TOTAL	4519.6	19155.5	23520.1	11898.3	5065.4	64158.9

5. Happy Valley (project area) Age Class Distribution

Table 4, displays the estimated age class distribution for the Happy Valley project area from SLI observations. Very few residuals from earlier timber harvests exist on the Happy Valley parcel. The upper canopy level of the stands on this parcel is the result of the past harvests. The majority of trees in the lower canopy levels are generally less than 80 years old and have grown as a result of the first major harvest on the parcel.

Table 4: Stand Level Inventory: estimated stand age by cover type in Happy Valley project area

	Sum of Acres in Age Class Groups (years):					
Cover Type:	00 – 39	40- 99	100 – 149	150+	Non Forest	Total
WL/DF	0	467.9	0	0		467.9
OTHER	0	0	0	0	13.4	13.4
TOTAL	0	467.9	0	0	13.4	481.3

6. Old Growth

In *Historical Vegetation of Montana* under Age Structure of Natural Stands it is noted that, " The final category (150+ years) represents a pool of acres of old aged trees, a portion of which may be considered old growth stands. The actual acres which may be considered old growth are somewhat elusive in that our understanding of the concept of old growth is limited and not rigidly defined by nature." It is recognized that stand age is an important criteria for determining old growth but would not realistically determine old growth acreage if used as the sole parameter. The Northern Region USFS publicized their effort to characterize old growth forest communities by cover type in a 1992 Internal Report: *Old –Growth Forest Types of the Northern Region,* by P. Green, J. Joy, D. Sirucek, W. Hann, A. Zack, and B. Naumann.

As per the State Forest Land Management Rule 36.11.403 (48)DNRC defines old growth by cover types, based on minimum number and size of large trees per acre and age of those trees as noted in *Old-Growth Forest Types Of The Northern Region*. Older stands within proposed project areas would be assessed for determining actual acreages that meet DNRC's old growth definitions. Old growth will be managed to meet biodiversity and fiduciary objectives pursuant to applicable State Forest Land Management Rules.

No stands within the project area met the criteria for DNRC's old growth definitions. Neither the age criteria or the stocking of large diameter trees per acre criteria were met in the Happy Valley timber stands,

7. Happy Valley Stand Characteristics

Stand characteristics helpful in describing existing stand conditions are summarized below in Table 6. Proposed Harvest Unit 2a, 2b, and 2c includes Stand 1 in Section 31, most of Stand 5 and all of Stand 6 in Section 29, and a portion of Stand 2 and all of Stands 3, 4, 5, 6, 7, 8, and 9 in Section 32. Proposed Harvest Unit 1a and 1b includes Stands 1, 2, 3, 4, and a portion of Stand 5 in Section 29 and Stand 1 and a portion of Stand 2 in Section 32. Refer to Happy Valley Stand Map, A4.

Table 6: General Stand Characteristics for Happy Valley Project Area.

Stand #	Acres	Current - Approp CT	Habitat Type	Stocking	Structure	Species Composition
1Sec29	11.7	WL/DF =	PSME/LIBO	WM	Single	L4, D4
2Sec29	23.0	WL/DF =	PSME/LIBO	WM	Multi	D6, L3
3Sec29	54.6	WL/DF =	PSME/LIBO	WM	Single	D6, L3
4Sec29	19.5	WL/DF =	PSME/LIBO	WM	Multi	D5, L4

Stand #	Acres	Current – Approp CT	Habitat Type	Stocking	Structure	Species Composition
5Sec29	42.4	WL/DF =	PSME/LIBO	WM	Single	D4, L4
6Sec29	86.5	WL/DF =	PSME/LIBO	WM	Single	D6, L3
1Sec31	32.4	WL/DF =	PSME/LIBO	WM	Single	D6, L3
1Sec32	16	WL/DF =	PSME/LIBO	WM	Single	D8, I2
2Sec32	38.7	WL/DF =	PSME/LIBO	WM	Single	D4, I4
3Sec32	5.4	WL/DF =	PSME/SYAL	WM	Single	L6, D3, S1
4Sec32	17.4	WL/DF =	PSME/LIBO	WM	Single	L7, D2
5Sec32	17.2	WL/DF =	PICEA/CLUN	WM	Single	D8, L2
6Sec32	11	WL/DF =	PSME/LIBO	WM	Single	L6, D3
7Sec32	6.3	WL/DF =	PSME/LIBO	WM	Single	D6, L4
8Sec32	54.2	WL/DF =	PSME/LIBO	WM	Single	D6, L3
9Sec32	31.6	WL/DF =	PSME/LIBO	WM	Single	D6, L3

Current – Approp CT: this column shows current and appropriate cover types are the same if followed by = sign. **Stocking:** W = well stocked, M = moderately stocked, P = poorly stocked. First letter represents overall stand stocking, second letter represents stocking of trees 9 inches or greater in diameter at breast height. **Structure:** single represents even-aged, single storied stands; multi represents 2 or 3 storied stands with even aged patches of various age classes. **Species composition:** L = western larch, D = Douglas-fir, LP = lodgepole pine, GF = grand fir, AF = alpine fir, S = spruce, WP = western white pine. Following numbers estimate percent of species compositions in the overstory, where 0 is less than 10% and 8 would represent 80 to 89%.

8. Happy Valley stand health and vigor

Overall stand vigor and health is rated as "fair to good" for all stands on this parcel. The Douglas fir is more vigorous than the western larch due to the effects of overstocking. Old thinning of a portion of Stand 2 in the southeastern corner of Section 29 released the remaining Douglas fir but had little or no affect on the western larch. Overall vigor is fair to good for Douglas fir and fair for western larch. *Armellaria spp.* root disease was identified in pockets of Douglas fir trees. Mortality ranges from several decades old to recent, and is affecting individual trees of all size and age classes within these pockets. Douglas fir bark beetles are attacking trees at increased levels for the last few years a may be indicative of increasing tree stress resulting from several years of drought, dense stocking levels, and the presence of root disease.

9. Adjacent Lands general forest conditions

Private residential subdivisions border this section on the north, east and west boundaries. Private forested lands border the Happy Valley parcel to the south. The majority of the forested acres within one mile of this parcel have been selectively harvested in the last few decades and subdivided for residential development. The private forested lands to the south have been managed for the production of forest products. Some agricultural land also exists within a mile of the parcel.

B. Sensitive, Threatened, and Endangered Plants – existing condition

A review of the records from the Montana Natural Heritage Program for the Rose Crossing topographic map quadrangle indicated no plant species of special concern identified within the project area.

C. Noxious Weeds – existing condition

Flathead County and DNRC have a "Cooperative Integrated Noxious Weed Management Agreement in compliance with the state law known as the County Weed Control Act (Section 7-22-2151, MCA). An annual coordination meeting between the County Weed Control District and DNRC allows for identification of weed problems; and determines an integrated approach at managing and treating priority areas as related to county and DNRC weed control goals.

At the landscape level, past activities have had a big impact on noxious weed populations. Land use activities such as logging, road building, livestock grazing and recreation have led to

increases in the amount and distribution of noxious weeds on the Kalispell Unit. This has occurred at the project level as well. Spotted knapweed and Saint Johnswort is present in patches generally less than ½ acre in size along road edges on state and adjacent lands.

D. Effects Analysis

1. Proposed Project Actions:

a.) Harvest/Logging:

Unit 1a & b: 160acres modified seedtree/machine scarify/partial plant WL & PP
Unit 2 a-c: 283 acres individual select/group select/machine spot pile/partial plant WL & PP
- all harvest units would be logged with ground based logging systems

b.) Roads:
~ 2.0 miles of reconstruction
~ 4.9 miles of unimproved logging roads are to be permanently closed and /or obliterated.

c.) After harvest treatments:
Unit 1a & b : machine pile and burn ~ 160 acres/ partial plant openings with WL & PP
Unit 2a, - c : machine spot pile and burn ~283 acres/ partial plant openings with WL & PP

d.) Silvicultural treatment requirements for implementation:
- Unit 1a & b - 40 foot spacing between seedtrees, variable spacing for growing stock. Cut all DF within 50 of root disease centers
- Unit 2a, b, & c –variable 20 to 35 foot spacing between leave trees. Cut all DF within 50 feet of root disease centers.
- Favor retention of ponderosa pine, western larch, and vigorous Douglas fir
- Remove all trees with thinning crowns or flattened tops
- Unit 1 & 2 – protect pockets of advanced regeneration
- Retain snags 7 inches DBH and larger wherever they occur, except within 200 feet of open roads and property boundaries.

2. Effects on Cover Type and Age Class Distribution

a). Direct and indirect Effects

1. *NO ACTION*: Short term effects are not anticipated with the no action alternative. In the long term, the general trend of increasing percentage of Douglas fir in stand species composition would continue without disturbance. Percentage of western larch would decrease in the long term, moving the cover type to DF and away from the appropriate DF/WL cover type. As displayed in Table 2, the Happy Valley parcel currently is in the DF/WL cover type, which is also the appropriate cover type. As trees in the upper canopy levels age the effect of density would be to decrease or stagnate individual tree growth rates in the younger, mid and lower canopy levels of most stands. Using the current definition of "old growth", it would require 50 to 70 years for the stands to reach the minimum age for possible classification as "old growth".

2. *ACTION ALTERNATIVE*: Harvesting according to silvicultural prescriptions would result in the reduction of stand density, providing for increased growth rates and vigor in younger trees. Openings created in the stands will allow for natural regeneration or spot planting areas for WL & PP, thereby continuing the species on the site. Age class groups for stands on the Happy Valley tract would remain unchanged or result in a decrease of age within the same age class group.

b. Cumulative Effects:

1. *NO ACTION ALTERNATIVE*: Without disturbance, the no action alternative would continue to perpetuate a trend toward more DF and fewer WL, moving the stands to a DF cover type. Because the potential for "old growth" stand development is low within the project area no measurable increase in "old growth" is anticipated.

2. *ACTION ALTERNATIVE*: Since the project area comprises less than 1% of the Kalispell Unit landscape and since the current cover type, which is the appropriate cover type, would be maintained, the magnitude of effects would be minimal. The action alternative would increase the proportion of forested acres of single storied, open canopied stands on state and surrounding lands.

3. Effects on other forest stand characteristics, health and vigor

a. Direct and Indirect Effects:

1. *NO ACTION ALTERNATIVE:* Forest stands would continue to grow and develop with out disturbance. As tree size and height increases, upper canopy level densities would close and competition between trees would increase. Growth rates and tree vigor are likely to decline. As individual trees succumb to competition and die, forest fuels are likely to increase.

2. *ACTION ALTERNATIVE:* Stocking in the upper canopy level on 431 acres would change from moderate stocking to poor stocking. Harvest units on 431 acres would retain some larger diameter western larch, ponderosa pine, and Douglas-fir distributed across the stands for seed sources and snag recruits. After harvest, tree competition would be reduced providing conditions for growth at site potential. Approximately 160 acres treated with machine piling and burning would promote regeneration of WL and PP and, therefore, more historic stand conditions by ensuring a higher percentage of WL and PP in species composition. Trees showing decline in growth and vigor would be removed during harvest operations, reducing the occurrence of stem decays and other pathogens. Overall stand vigor would be sustained or improved on 431 acres.

b. Cumulative Effects:

1. No Action Alternative: Stands within this parcel would continue to age, becoming older and denser as time passes. As individual trees, both younger suppressed trees and older trees, succumb to competition, the forest fuels will likely increase.

2. Action Alternative: On 431 acres treatment would provide conditions promoting development of future stands with more historic stand characteristics. Existing roads would be used to harvest the parcel. After harvest, approximately 4.9 miles of road will be closed or obliterated. Treatment of slash to high standards along the ownership lines would maintain forest fuels (ladder and downed woody) at low to moderate levels for the next several decades.

INTRODUCTION

DNRC attempts to promote biodiversity by taking a 'coarse-filter approach', which favors an appropriate mix of stand structures and compositions on State lands (ARM 36.11.404). Appropriate stand structures are based on ecological characteristics (e.g., land type, habitat type, disturbance regime, unique characteristics). A coarse-filter approach assumes that if landscape patterns and processes are maintained similar to those with which the species evolved, then the full complement of species will persist and biodiversity will be maintained. This coarse-filter approach supports diverse wildlife populations by managing for a variety of forest structures and compositions that approximate historic conditions across the landscape. DNRC cannot assure that the coarse-filter approach will adequately address the full range of biodiversity; therefore, DNRC also employs a "fine filter" approach for threatened, endangered, and sensitive species (ARM 36.11.406). The fine-filter approach focuses on a single species' habitat requirements.

In this section the discussions will focus on 2 areas of different scale. The first will be the "project area", which consists of the state portions of sections 29,31, & 32 in T31N R21W. The second scale or the "analysis area" relates to the surrounding landscape for assessing cumulative effects (Figure W-1). The scale of this analysis area varies according to the species being discussed, but generally approximates the size of the home range of the discussed species. In the cumulative effects analysis area, prior and reasonably foreseeable future State actions, and existing conditions on adjacent ownerships were considered and discussed. Species were dismissed from further analysis if habitat did not exist in the project area or would not be modified by any alternative.

To assess the existing condition of the proposed project area and surrounding landscape, a variety of techniques were used. Field visits, scientific literature, SLI data, aerial photographs, Montana Natural Heritage Program data, and consultations with other professionals provided information for the following discussion and effects analysis. Specialized methodologies are discussed under the species in which they occur.

During the initial scooping the following issues were expressed regarding the effects of the proposed project:

- Timber harvesting activities may affect Threatened, Endangered, and sensitive wildlife species.
- Timber harvesting activities may affect ungulate habitat.
- Timber harvesting activities may affect diversity of wildlife species.
- Timber harvesting activities may cause habitat fragmentation and reduce habitat for old stand associated species.

Coarse Filter

Existing Environment

Overview

The majority of terrestrial vertebrates present on this parcel at the time of European settlement likely still occur in the proposed project area. Species that rely on special habitat elements such as burned areas may not be present or are in decline due to the decline of these elements across the landscape.

Influence of Fire

Historically, wildfire was the primary disturbance factor shaping the stands in the proposed project area and substantial portions of the forested communities in this area (Losensky 1997). Forested patches on the landscape were likely a mosaic of stands that established following a number of disturbances of varied type, intensity, and magnitude. Frequent fire return intervals (5-25 years) reduced encroaching Douglas-fir *(Pseudotsuga menziesii)* and maintained western larch *(Larix occidentalis)*/Douglas-fir stands in more open, park-like conditions with fire-resistant mature trees and small patches of even-aged regeneration. Reduction in natural fire frequency through fire suppression in the last 100 years has led to denser stands with a higher proportion of stagnated shade-tolerant tree species, like Douglas-fir.

Fire-associated species such as the black-backed woodpecker (*Picoides arcticus*) are probably less abundant on the landscape currently than would typically have been expected under natural fire regimes, and species preferring dense coniferous in-growth of shade tolerant tree species (such as Douglas-fir and grand fir [*(Abies grandis)]*) under mature forest canopy likely benefited.

Stand-Age and Cover-Type Characteristics

Mature and old stands are essential habitat for wildlife species associated with the late successional stages of forest stand development for all or some life requirements. A partial list of these species includes pileated woodpeckers (*Dryocopus pileatus)*, American marten (*Martes americana*), brown creepers (*Certhia americana)*, and winter wren (*Troglodytes troglodytes*). The proposed project area currently contains mature stands (40-99 years in age) of Douglas-fir/western larch and there are no old-stands in the proposed project area. On the Kalispell Unit, there is less acreage in western larch/Douglas-fir and western white pine *(Pinus monticola)* cover types and more acres in mixed conifer and subalpine fir *(Abies lasiocarpa)* types than perceived historical conditions. This change is likely a result of past management and fire suppression.

Snags and defective trees (partially dead, spike top, broken top) are used by a wide variety of wildlife species for nesting, denning, roosting, feeding, and cover. Snags and defective trees may be the most valuable individual component of Northern Rocky Mountain forests for wildlife species (Heijl and Woods 1991). The quantity, quality, and distribution of snags affect the presence and population size of many cavity-dependent species. In the Flathead Valley, at least 42 species of birds and 10 species of mammals are dependent on snags and dead-wood habitat for nesting, feeding, or shelter (Flathead National Forest, 1993). Great horned owls are included on this list and frequently use snags for hunting, roosting, and nesting. These owls are year-round resident, nocturnal predators that primarily prey upon small- to mid-sized mammals. They forage in all stages of forest succession and reproduce in stands older than 40 years in age (Thomas 1979).

Patch Characteristics

Encroachment by shade-tolerant tree species due to modern fire suppression has led to more extensive and continuous patches of forests, thereby reducing natural habitat fragmentation. Through this process, patch size has likely increased and the small openings on the landscape generated by the small or low intensity fire disturbances have been largely eliminated. Fire suppression has also increased the potential for large stand-replacing fires that could propagate larger patch sizes than found under historically frequent, low intensity fire regimes.

Not only does habitat patch size influence use by various wildlife species, but the arrangement and juxtaposition can also influence habitat quality for some wildlife species. Some species benefit from the transitional edge created between 2 or more habitat types, while others are adversely affected by these edges or the species that frequently use these edges. Edge habitats that were a by-product of frequent disturbances have also been largely removed by modern fire suppression. High amounts of disturbance, maintained openings, and harvesting have contributed to greater levels of edge habitats than would have been expected historically. Interior-forested habitats are those areas buffered by enough forest so that they are not affected by disturbance or other edge effects. For this analysis, interior habitats were those portions of stands greater than 300 feet from disturbance or major opening. The proposed project area is largely forested, with low amounts of edge habitats. Presently some edge habitats exist along the edges of 2 small wet meadows and portions of the eastern parcel boundary. On the state section there is presently 359 acres of interior forest habitat.

Brown-headed cowbirds are brood parasites that may be associated with edge habitats. Brood parasites remove an egg from the nest of another bird and replace it with an egg of their own. The young are then raised by the host bird(s), and since the cowbird chicks tend to be larger than many of their host chicks, they tend to out-compete the host chicks. Cowbirds are thought to focus their parasitism activities along forest edge habitats, however studies of cowbird brood parasitism in relation to edge habitats are

somewhat inconclusive. Some studies show elevated levels of cowbird parasitism near forested edges, while others demonstrate levels of brood parasitism and nest predation are similar between edge and core forested habitats (Donovan et al. 1997).

Landscape Connectivity

Some wildlife species, such as fisher (*Martes pennanti*), do not cross large, non-forested habitats when traveling between patches of suitable habitat. Therefore, landscape connectivity of forested habitats types is important for facilitating movement for these species. Connectivity under historical fire regimes likely remained relatively high as fire differentially burned habitats across the landscape. Today, the mosaic of ownership and diversity of past management within the general vicinity of the proposed project area have compromised connectivity to a large degree.

Special Habitats

No avalanche chutes, rock outcrops, or cliffs are within the proposed project area. There is an intermittent and discontinuous stream within the proposed project area. Two small wet meadows exist within the proposed project area.

Direct and Indirect Effects

No-Action Alternative

Forest conditions would continue to move toward denser stands of Douglas-fir/western larch with high canopy cover. Compared to the perceived historical conditions, this change in stand structure, composition, and dominant disturbance regime has resulted in larger patch sizes, fewer small openings, and less edge habitat. Under this alternative, no immediate changes are anticipated in patch size, shape, amounts of edge habitat, landscape fragmentation, or landscape connectivity. Over time, western larch in the proposed units would die, and replacement of these shade-intolerant tree species would be limited without other disturbance. A dense stand of Douglas-fir with scattered western larch would likely result. Limited riparian habitats would persist along the intermittent stream and no changes to the wet meadows are expected with this alternative.

Wildlife favoring dense stands of Douglas-fir would benefit from this gradual change, while those requiring open, mature western larch/Douglas-fir stands likely found under natural disturbance regimes would continue to be underrepresented. Future habitat for old stand-associated species like American marten, northern goshawk, and pileated woodpeckers would continue developing over time. The limited habitat for forest-interior species on state lands (359 acres) is not expected to appreciably change with this alternative. No changes are expected in the number or distribution of snags and coarse woody debris on the state parcel. Habitat for great horned owls and their prey would persist. Cowbird numbers and subsequently levels of brood parasitism are expected to remain relatively constant.

Action Alternative

The canopy on approximately 430 acres would be opened up. Additionally, mature western larch and some Douglas-fir would be retained, while much of the shade-tolerant Douglas-fir midstory would be removed. These conditions would lead to more open stands of mature western larch and Douglas-fir. Regeneration of shade-intolerant western larch is expected based upon silvicultural prescriptions. The stands on the eastern portion of the state parcel are expected to become dominated by western larch, while those on the western portion would likely remain more mixed Douglas-fir and western larch. The proposed project area is largely forested with limited amounts of edge habitats around wet meadows and along portions of the parcel boundary. The proposed prescriptions would have minor changes to edge habitats, because harvests would reduce, but not eliminate forest cover. However, some near-term increases in edge habitats due to the increased openness may result from this alternative.

Negligible changes to patch size, shape, landscape connectivity, and habitat fragmentation are expected. The resulting stands, being more open than the current stands and dominated by western larch and Douglas-fir, would be more sustainable while being less susceptible to stand replacing fires. No appreciable changes to the wet meadow or the species that utilize it are anticipated.

These open stands of mature trees would favor species requiring more open habitats as likely existed under natural disturbance regimes, while negatively impacting those species that use dense, multi-layered stands. Extensive firewood gathering on the state parcel has largely eliminated much of the snag and dead-wood habitats from the state parcel. Snags and dead-wood would be removed from approximately 43 acres (approx. 10% of area treated under this alternative) in the Special Operating Area along the parcel boundaries, however habitat for species using snags and dead-wood would be maintained within the other proposed units. Future habitat for old stand-associated species like American marten, northern goshawk, and pileated woodpeckers would be reduced in the short-term, however the retention of mature trees is expected to expedite the development of a multi-layered canopy, which would benefit these species in the long-term. However, future use is unlikely for many of these species because of high levels of disturbance and the relatively small size of the state parcel. Habitat for forest-interior species, especially a variety of resident and migrant birds, would be reduced by 359 acres with this alternative. By opening up the stands, this alternative could remove some great horned owl nesting habitat, but foraging habitat would persist. Prescriptions for this alternative call for the retention of existing snags and coarse woody debris outside the Special Operating Area, which would benefit great horned owls and their prey. Changes in sub-canopy and ground cover vegetation may alter available habitat for great horned owl prey species. Short-term increases in edge habitats may increase some great horned owl prey numbers.

Cowbird numbers are not expected to appreciably change with this alternative. Cowbirds use forested tracts, open habitats, and the edge habitats between these types. Studies are largely inconclusive about the effects of a more open stand and greater amounts of edge habitats on the levels of cowbird brood parasitism, despite considerable attention given to the perceived increases in parasitism levels within more fragmented landscapes. Some effect is expected, however inconclusive studies make this determination difficult. The proposed project would be improving habitat conditions for birds requiring more open, mature stands and species requiring shrub stages for nesting; the proposed project would reduce habitat for bird species requiring multi-layered forested habitats and foliage-gleaning species. The proposed project may have an effect on bird nest success, and ultimately local population numbers, through alterations to habitat and potential changes in levels of brood parasitism and nest predation, however these reductions may be somewhat offset by the increases in available habitat for other bird species.

Cumulative Effects

<u>No-Action Alternative</u>

Under this alternative, the existing habitats within the proposed project area would continue to provide habitat for wildlife requiring denser stands with a closed canopy. To the north and west of the proposed project area, housing subdivisions have fragmented the landscape and introduced considerable anthropogenic disturbance. Compared to more traditional subdivisions, these subdivisions are somewhat unique, as they have retained some of the forested attributes interspersed with the human development, which would lessen the effect of the subdivision to some species that are able to tolerate human disturbance within their habitats. To the east of the proposed project area is considerable agricultural fields and other human-influenced open habitats. These have, and presumably would continue to provide habitat for species requiring open field habitats. As such these areas may be providing habitat for brown-headed cowbirds which may be acting as brood parasites to birds nesting in the state parcel or other forested parcels in the analysis area.

Smaller woodlots exist to the south and southwest of the proposed project area, contributing to the amount of forested habitat in the analysis area. Edge habitats exist between the various open habitats

and the forested patches within the analysis area. Other small house-lots and clearings have further fragmented the forested stands in the area. Beyond the housing subdivisions to the west of the proposed project area is Highway 93, which is a major travel route and has separated much of the analysis area from the forested blocks on the other side of the highway.

Actions under this alternative would result in minor changes in patch size and configuration. Landscape connectivity has been largely compromised due to the levels of human disturbance in the area. The analysis area, being largely a mosaic of different habitat conditions (forests, human development, agriculture and other open fields), likely supports a diverse array of wildlife favoring a mix of conditions. Recent harvesting and human development on adjacent parcels have reduced habitats for forest-interior species in the analysis area. Firewood gathering on the state parcel along with recent harvesting and development has reduced habitat for wildlife that use snags. Use of the analysis area by great horned owls and their prey would be expected to continue at relatively similar levels. The wet meadow that enters the state parcel along the western edge has been encroached upon by the housing subdivisions in the area. High levels of human disturbance have likely reduced the use of this meadow by many of the wildlife species commonly using meadows. Subsequently, the use of the state portion of the meadow has likely been reduced.

Action Alternative

Under this alternative, stands on the state parcel would be opened up, increasing tree spacing while decreasing canopy closure. Proposed harvest units would blend with several recent harvest units on adjacent parcels, particularly to the north and east of the state section. Habitat quality for wildlife species that benefit from the dense stands of Douglas-fir would decrease, while those species that require more open stands of western larch and Douglas-fir would benefit. Sustainability of this larger stand of western larch/Douglas-fir in the future is improved. Habitat for old stand species could start developing in this patch in 50-70 years, however human development in the area would likely eliminate appreciable use of this area by the species requiring these habitats. Limited, existing snags and defective trees would be retained with in the main portions of the proposed project area, so no further reductions in habitat for species using snags, including great horned owls, would be expected. Forest-interior species would experience a further reduction in available interior habitat in the analysis area. Levels of cowbird parasitism and other nest predation may increase due to the increased openness within the analysis area. Again, landscape connectivity has been compromised with recent harvests and housing subdivisions, and no further reduction in landscape connectivity is expected to occur under this alternative. The portion of the wet meadow entering the state parcel from the west would not be compromised, however encroachment from the subdivision has likely limited overall use of this meadow.

B. Fine Filter

In the fine-filter analysis, individual species that are recognized to be of special concern are evaluated. These species are addressed below and include Federally "threatened" or "endangered" species, species listed as "sensitive" by DNRC, and species managed as "big game" by Montana Fish Wildlife, and Parks.

1. Threatened and Endangered Species

Four species indigenous to Montana area classified as "Threatened" or "Endangered" under the Endangered Species Act of 1973. The bald eagle, grizzly bear, and Canada lynx are listed as "Threatened", while the gray wolf is listed as "Endangered".

a. Bald Eagle *(Haliaeetus leocucephalus)*

Issue: There is concern that timber harvesting could alter habitat or create disturbance that would be detrimental to bald eagles.

Existing Environment

Strategies to protect the bald eagle are outlined in the Pacific States Bald Eagle Recovery Plan (USFWS 1986) and the Montana Bald Eagle Management Plan (Montana Bald Eagle Working Group 1994). Management direction involves identifying and protecting nesting, feeding, perching, roosting, and wintering/migration areas (USFWS 1986, Montana Bald Eagle Working Group 1994). The nearest bald eagle nests were known to occur 10-11 air miles north and west of the proposed project area near Whitefish Lake. Occasional use of the proposed project area by foraging bald eagles might occur during the winter when eagles are more dependent upon big game carrion. Overall, habitats found within the state parcel and surrounding vicinity have low inherent value for bald eagles. No cumulative or localized effects that would positively or negatively influence bald eagles would be expected to occur as a result of either alternative considered. Therefore, this species will not be considered further in this analysis.

b. Grizzly Bear *(Ursus arctos)*

Issue: There is concern that timber harvesting and associated activities could alter habitat or create disturbance that would be detrimental to grizzly bears.

Existing Environment

Grizzly bears are wide-ranging mammals that use forested upland habitats. Preferred grizzly bear habitats are meadows, riparian zones, avalanche chutes, subalpine forests, and big game winter ranges, all of which provide seasonal food sources. The project area is approximately 7 miles southwest of the North Continental Divide Ecosystem Recovery Zone (USFWS 1993), contains a limited amount of preferred grizzly bear habitats (430 acres of big game winter range), and there have been no documented observations of grizzly bears in the proposed project area. Grizzly bear use is unlikely due to surrounding habitat conditions and high levels of human development. Since neither alternative is expected to affect grizzly bears, this species will not be considered further in the analysis.

c. Gray Wolf *(Canus lupus)*

Issue: There is concern that timber harvesting could alter habitat or create disturbance that would be detrimental to the gray wolf.

Existing Environment

The Northern Rocky Mountain Wolf Recovery Plan defines 3 recovery areas (USFWS 1987, USFWS et al. 2002). The proposed project area falls within the Northwest Montana Wolf Recovery Area.

The wolf is a wide-ranging species whose habitat contains adequate vulnerable prey and minimal human disturbance. Primary prey species in northwestern Montana are white-tailed deer, elk, moose, and mule deer. The distribution of wolves is strongly associated with white-tailed deer winter range.

Wolves choose elevated areas in gentle terrain near a water source (valley bottoms), close to meadows or other openings, and near big game wintering areas for dens and rendezvous sites. The project area contains big game winter range and is on moderate terrain. There has been no documented wolf activity near the project area, and high levels of human disturbance and development would likely eliminate this area from potential future use as the wolf populations increase through time. Wolves might pass through the area sporadically. Nearest documented wolf activity has been in Lazy Creek/Swift Creek area 16-18 air miles north and west of the project area (T. Meier, USFWS, pers. comm. Jan. 2003). Since neither alternative is expected to affect wolves, this species will not be considered further in the analysis.

d. Canada Lynx *(Felis lynx)*

Issue: There is concern that timber harvesting could alter habitat or create disturbance that would be detrimental to lynx.

Existing Environment

Lynx are associated with subalpine fir forests generally between 4,000 to 7,000 feet in elevation in western Montana (Ruediger et al. 2000). The proposed project area ranges from approximately 3,100 to 3,200 feet and is dominated by Douglas-fir and western larch, with some ponderosa pine *Pinus ponderosa).* Typical lynx denning habitat consists of mature spruce-fir with abundant coarse woody debris; typical lynx foraging habitat consists of younger coniferous forests with an abundance of snowshoe hares. Such habitats are not present in the proposed project area. Since neither alternative is expected to affect Canada lynx, this species will not be considered further in the analysis.

2. Sensitive Species

When conducting forest-management activities, DNRC gives special consideration to several sensitive species. These species are sensitive to human activities, have special habitat requirements that might be altered by timber management, or might become listed under the Federal Endangered Species Act if management activities result in continued adverse impacts. Because sensitive species usually have specific habitat requirements, consideration of their needs serves as a useful "fine filter" for ensuring that the primary goal of maintaining healthy and diverse forests is met.

A search of the Montana Natural Heritage Database documented no sensitive species occurrence records in the proposed project area or within 1 mile. A DNRC Biologist conducted a field review of the project and analysis areas. Each sensitive species was either included in the following analysis, or was removed from further analysis due to habitat availability considerations (Table W-1).

a. Pileated Woodpecker *(Dryocopus pileatus)*

Issue: There is concern that timber harvesting could alter habitat or create disturbance that would be detrimental to the pileated woodpecker.

Existing Environment

Pileated woodpeckers excavate the largest cavities of any woodpecker. These cavities are frequently used in subsequent years by many other species of birds and mammals. Preferred nest trees are western larch, ponderosa pine, cottonwood, and aspen, usually 20 inches dbh and larger. Pileated woodpeckers primarily eat insects, mainly carpenter ants, inhabiting large downed logs, stumps, and snags. Nesting habitat for pileated woodpeckers consists of mature stands below 5,000 feet in elevation with 100-125 ft^2/ac basal area and a relatively closed canopy (Aney and McClelland 1985). The feeding and nesting habitat requirements, including large snags or decayed trees for nesting and large downed wood for feeding, closely tie these woodpeckers to mature forests. The density of pileated woodpeckers is positively correlated with the amount of dead and/or dying wood in a landscape (McClelland 1979). Modeling the above conditions using SLI data generated an estimate of pileated woodpecker habitat.

None of the proposed project area was identified as potential pileated woodpecker nesting habitat in the habitat model due to stand ages. These stands are still too young to be considered preferred pileated nesting habitat. However, younger-aged stands are frequently used for foraging and may provide lower quality nesting habitat. During field visits very few snags (0-1/acre) and feeding sites were observed in the state parcel.

Cumulative effects were analyzed on the surrounding 8 sections (Figure W-1) using a combination of field evaluation and aerial photograph interpretation. Factors considered within the analysis area included the degree of harvesting and the amount of continuous forest within the analysis area.

Direct and Indirect Effects

No-Action Alternative

No direct impacts are anticipated under the No Action Alternative. Remaining shade-intolerant trees would continue to grow and die over time, providing nesting and foraging habitats. As these trees die, the stands would gradually become dominated by Douglas-fir unless disturbance influences the stands, allowing for regeneration of these shade-intolerant species. Therefore, a reduction in suitable nesting trees is likely over time. Pileated woodpeckers typically do not nest in Douglas-fir; however they will forage on the boles of Douglas-fir. Under the No Action Alternative, stands once dominated by western larch and Douglas-fir would continue to be converted to Douglas-fir stands through succession, become densely stocked, and exist at high risk to insects, disease and stand-replacement fire. Thus, habitat sustainability and quality for pileated woodpeckers would then decline over time.

Action Alternative

Pileated woodpeckers tend to be tolerant of human activities (Bull and Jackson 1995), but might be temporarily displaced by proposed harvesting. Elements of forest structure important for nesting pileated woodpeckers would be retained, including snags (limited numbers that exist, outside the Special Operating Area), coarse woody debris, and some shade-intolerant trees. After the proposed harvest, 430 acres of more open stands of western larch, Douglas-fir, and scattered ponderosa pine would probably be too open to be considered preferred pileated foraging habitat, and development of suitable nesting habitat would be further delayed with the increased tree spacing and decreased canopy cover. Pileated woodpecker use of the state parcel is expected to decline with the proposed activities that would remove canopy cover and foraging substrates. Under this alternative, stands expected to mature into suitable pileated woodpecker nesting habitat in the near-term would be harvested. However, as a more uneven-aged stand develops, quality of foraging and nesting habitats for pileated woodpeckers are expected to improve over the next several decades. This more open stand should also lead to the recruitment of shade-intolerant western larch that could benefit pileated woodpeckers in the future by providing nesting, roosting, and foraging substrates. Short-term habitat suitability would be reduced while the stand is more open, but long-term use is more probable given the silvicultural prescriptions improving habitat sustainability through time.

Cumulative Effects

No-Action Alternative

Under the No Action Alternative, habitats on the state parcel would continue to grow and die over time, providing nesting and foraging habitats. Through time, the increased representation of Douglas-fir in the stands would reduce nesting substrates for pileated woodpeckers. Habitats on adjacent small woodlots to the east have been partially harvested through a combination of thinning and shelterwood cutting methods, which has opened up the stands to a point that appreciable pileated woodpecker use is unlikely. Woodlots to the south of the proposed project area would, if unmanaged, likely continue along the path of aging and cover type conversion similar to the stands on the state parcel. Large areas of non-forested habitats such as agricultural areas, pastures, house-lots, and other openings exist in the analysis area to the east and south of these small woodlots. Pileated woodpecker habitat does not exist in these non-forested habitats and these parcels are not expected to develop attributes necessary for pileated woodpecker use in the short-or long-term. Housing subdivisions to the north and west of the proposed project area have eliminated some of the pileated woodpecker habitats within these areas. Further east across highway 93, contiguous blocks of forested habitat exist, which may be used by pileated woodpeckers using the state section as well. In the near-term, the analysis area would likely continue providing nesting and foraging habitats for a pair of pileated woodpeckers. The encroachment of housing subdivisions and associated development likely limits present and future uses of these areas. No planned changes in access management are planned with this alternative,

and continued loss of remaining snags and snag recruits would continue to degrade future pileated woodpecker habitat.

Action Alternative

Under the Action Alternative, reductions in pileated woodpecker habitat are expected. Existing snags (except in the Special Operating Area), coarse woody debris, and suitable nesting trees would be retained within the proposed project area; however, the canopy on the state section would likely be too open for appreciable pileated woodpecker use. Suitable nesting trees may exist within the small woodlots, as leave trees within the proposed activities, and within the housing subdivision; however the open stands on the state parcel in conjunction with the other disturbances and relatively open canopy would largely eliminate pileated woodpecker use of the analysis area. The loss of dense, mature forests on the state parcel would be additive to the recent reductions on adjacent woodlots and continued development within the housing subdivisions. In the future (40+ years), the habitats on the state parcel could provide suitable habitats for pileated woodpeckers in the general vicinity. Access management would be required to retain existing snags and snag recruits for future pileated woodpecker use. However, with the encroaching subdivisions and other development in the analysis area, it is unlikely that the analysis area would be capable supporting a pair of pileated woodpeckers following the proposed harvesting.

Mitigation Measures Included:

- Favor western larch in retention and regeneration decisions.
- Reduce motorized access to reduce potential loss of existing snags to firewood gathering.
- Manage for snags, snag recruits, and coarse woody debris according to ARM 36.11.411,36.11.413, and 36.11.414, particularly favoring western larch, ponderosa pine, and black cottonwood

Table 3-4 – Listed Sensitive Species for the Northwestern Land Office showing the status of these species in relation to this proposed project.

Species	Determination – Basis
Black-backed woodpecker	Dismissed – No recently (less than 5 years) burned areas or areas experiencing substantial insect infestation are in the project area.
Boreal owl	Dismissed – No cool, structurally diverse, spruce-fir habitats at latter stages of development above 5,200 feet are in the project area
Coeur d'Alene salamander	Dismissed – No moist talus or streamside talus habitat occurs in the project area.
Columbian sharp-tailed grouse	Dismissed – No suitable grassland communities occur in the project area.
Common loon	Dismissed – No suitable lake habitats occur within the project area.
Ferruginous hawk	Dismissed – No suitable grassland communities occur in the project area.
Fisher	Dismissed – No suitable forested riparian areas occur in the project area.
Flammulated owl	Dismissed – No suitable dry Ponderosa pine habitats occur within the project area.
Harlequin duck	Dismissed – No suitable high-gradient stream or river habitats occur in the project area.
Mountain plover	Dismissed – No suitable short-grass prairie or prairie dog towns occur in the project area.
Northern bog lemming	Dismissed – No suitable sphagnum meadows or bogs occur in the project area.

Peregrine falcon	Dismissed – No suitable cliffs/rock outcrops occur in the project area.
Pileated woodpecker	**Included** – Western larch/Douglas-fir, and limited Ponderosa pine habitats occur in the project area.
Townsend's big-eared bat	Dismissed – No caves or mine tunnels occur in the project area.

3. Big Game

a. Big Game Security

Issue: There is concern that timber harvesting associated with this proposed project could have adverse effects on elk and other big game security.

Existing Environment

The proposed project area falls within hunting district 170. In the northern portion of the hunting district where the proposed project lies, hunting is limited to the use of archery equipment, shotguns, traditional handguns and muzzleloaders due to higher human densities. The hunting district falls within the North Swan-Flathead Valley Elk Management Unit (EMU), which covers approximately 300 square-miles (DFWP 1992). High human densities and low levels of access have limited hunting opportunities.

Timber harvest can increase elk vulnerability by changing the size, structure, juxtaposition and accessibility of areas that provide security during hunting season (Hillis et al. 1991). As visibility and accessibility increase within forested landscapes, elk and deer have a greater probability of being observed and subsequently harvested by hunters. Because the female segments of the elk and deer harvest are normally regulated carefully, primary concerns are related to substantial reduction of the male segment and subsequent decrease in hunter opportunity. The presence of fewer males at the beginning of the hunting season reduces the odds of any given hunter to see or harvest such an animal throughout the remainder of the season.

Dense forest patches (≥ 250 acres) at least a half-mile from an open road that would provide elk (and subsequently deer) security (Hillis et al. 1991) during the general rifle season are not present on the state parcels. This lack of habitat coupled with adjacent housing subdivisions reduces habitat quality and likely use of the state sections. Use of the area by elk is unlikely; deer were documented in the state parcel during summer and winter field visits. Hunting opportunities are limited by the close proximity of the housing subdivisions in the area.

Cumulative effects to big game security were analyzed on hunting district 170 (102,000 acres) using a combination of field evaluation and aerial photograph interpretation.

Direct and Indirect Effects

<u>No-Action Alternative</u>

No changes in elk and deer security cover are expected. No change in hunting access is expected. Timber stands would continue advancing to climax plant species. No alterations in cover would occur that would increase big game vulnerability during the hunting seasons. Limited hunting opportunity would exist within the state section for any type of hunting.

<u>Action Alternative</u>

Big game hiding cover would be reduced with the proposed activities, thereby increasing elk and deer vulnerability. In the short-term, as regeneration advances in the understory, hiding cover would improve, however, security cover would still be absent from the state parcel. No changes to public access are expected, so changes in hunting pressure are unlikely. Limited habitat and close proximity to housing developments would likely reduce deer and elk use of the area during the general hunting seasons. Regulations restricting firearm use and high levels of human development would continue to limit hunting opportunity on the state section.

Cumulative Effects

No-Action Alternative

Over time habitats on the state parcel would become denser, offering greater hiding cover, benefiting big game using the state section during the hunting seasons. No improvement in big game security is anticipated since no changes in access are expected. High road densities and considerable development in the analysis area would continue to prevent elk and deer use of the area for security cover. Any future activities in the analysis area would not be expected to improve big game security in the analysis area due to the anticipated human growth in the area. Hunter success in the proposed project area and the hunting district are not expected to change.

Action Alternative

Negligible changes to big game survival are anticipated. No changes in big game security are anticipated. A reduction in hiding cover caused by the proposed harvest would be additive to the reductions associated with human developments in the area and recent harvesting activities. The effects of these reductions in cover are minimal because of the development and subdivision occurring within the relative vicinity, likely reducing big game use and subsequently hunter use of the area. Hunter success in the vicinity may experience a slight decline with a reduction in suitable hiding cover in the near-term, however the shifts in big game use and subsequently hunter success would be localized and would not influence hunter success rates at the hunting district level.

Mitigation Measures Included:

- Minimize number of open roads and restrict access on old roads and skid trails to reduce the potential for unauthorized motor vehicle traffic.

b. Big Game Winter Range

Issue: There is concern that timber harvesting activities associated with this proposed project could reduce cover important for the survival of wintering elk, white-tailed deer, and mule deer.

Existing Environment

Winter ranges enable big game survival by minimizing the effects of severe winter weather conditions, which can be limiting for populations. Winter ranges tend to be relatively small areas that support large numbers of big game, which are widely distributed during the remainder of the year. Winter ranges suitable for buffering the effects of severe winter conditions have adequate midstory and overstory to reduce wind velocity and intercept snow, while moderating ambient temperatures. Besides providing a moderated climate, the snow-intercept capacity effectively lowers snow depths, which enables big game movement and access to forage.

Montana Fish, Wildlife, and Parks (DFWP) identified the proposed project area as white-tailed deer (*Odocoileus virginianus)* winter range. The winter range within the project area is a part of a huge complex that extends south along Flathead Lake and to the north of Whitefish Lake. Approximately 430 acres of the 117,000-acre winter range fall within the state section. The state parcel is geographically on the edge of this larger winter range. The winter range on the state section ranges from 3,000 to 3,300 feet in elevation, which are generally some of the lower elevations within this

winter range. On average, this area receives lower amounts of snowfall than winter ranges in other portions of northwestern Montana. Proximity to housing subdivisions and other human development likely limits wintering big game use. Evidence of summer and winter use by white-tailed deer was noted throughout the proposed project area during field visits.

Cumulative effects were analyzed on the contiguous 117,000-acre white-tailed deer winter range (Figure W-2) using a combination of aerial photograph and field evaluation. Factors considered within the analysis area include acres of winter range harvested and level of human disturbance and development.

Direct and Indirect Effects

No-Action Alternative

Under this alternative, big game thermal cover in the state parcel would not be altered over the short-term. Existing stands would continue to provide thermal cover for white-tailed deer. In the long-term, continued succession would improve thermal cover while decreasing forage production. Levels of human disturbance within the state parcel would remain relatively constant, including disturbance within the winter range, which could stress big game using the area.

Action Alternative

If logging under this alternative occurs during the summer/fall months no displacement of wintering big game would occur, but if harvesting occurs during the winter, displacement of wintering big game is likely. Slash from winter harvesting could provide forage for big game wintering in the area. Shifts in habitat use within the winter range are expected. Canopy cover would be reduced on the entire 430 acres of winter range documented by DFWP in the proposed project area. Portions of the western units could still provide limited thermal cover. The retention of western larch in the eastern units would not provide thermal cover in the winter. The importance of snow intercept and thermal cover in this winter range is reduced due to the lower annual snowfall received within this winter range. However, during more severe winters, the importance of snow intercept and thermal cover is much greater to the survival of ungulates using these areas. Proposed timber harvests would not prevent big game movement through the area during normal winters. Being situated geographically on the edge of the winter range and within an area of human development, appreciable wintering big game use is not likely.

Cumulative Effects

No-Action Alternative

No changes are anticipated in thermal cover and snow intercept. The state section is located along the eastern edge of the larger 117,000-acre winter range identified by DFWP. Subdivision and harvesting on adjacent parcels has reduced thermal cover and snow intercept in the immediate vicinity of the proposed project area. Considerable human development, limiting available habitat, has occurred elsewhere in the larger winter-range. The thermal cover on the state section may be providing winter habitat for some resident big game in the area, however the human development in the vicinity of the proposed project has likely eliminated use of the state parcel by migratory big game.

Action Alternative

The reduction of 430 acres with the proposed project would have negligible effects on the larger 117,000-acre winter range. The proposed reduction in thermal cover on 430 acres (0.4% of larger winter range) would be additive to the reductions in thermal cover and snow intercept due to human development and other harvesting in the general vicinity and in the larger winter range. The high levels of human development have likely already eliminated much of the area

surrounding the state parcel from the available big game winter range. Big game populations (primarily the resident deer using the winter range) would likely see a slight reduction in winter survival in the short-term, however the capacity of the larger winter range is not expected to change with the proposed project.

Mitigation Measures Included:

- Retain patches of dense vegetation in harvest units within winter range when possible to provide some thermal cover/snow intercept capacity.
- Minimize number of open roads and restrict access on old roads and skid trails to reduce the potential for unauthorized motor vehicle traffic.

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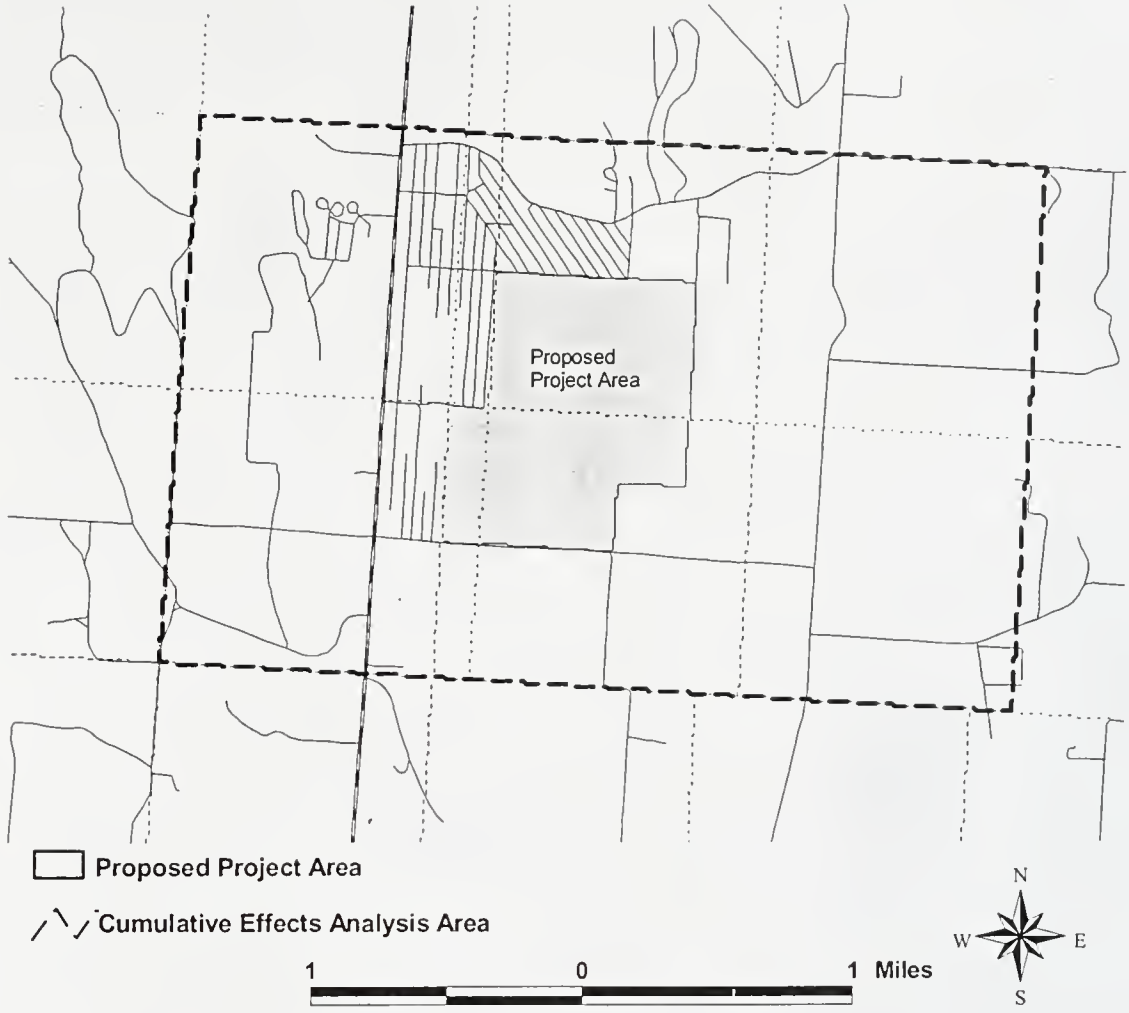

Figure W-1. Proposed project area and cumulative effects analysis area for the Happy Valley timber sale.

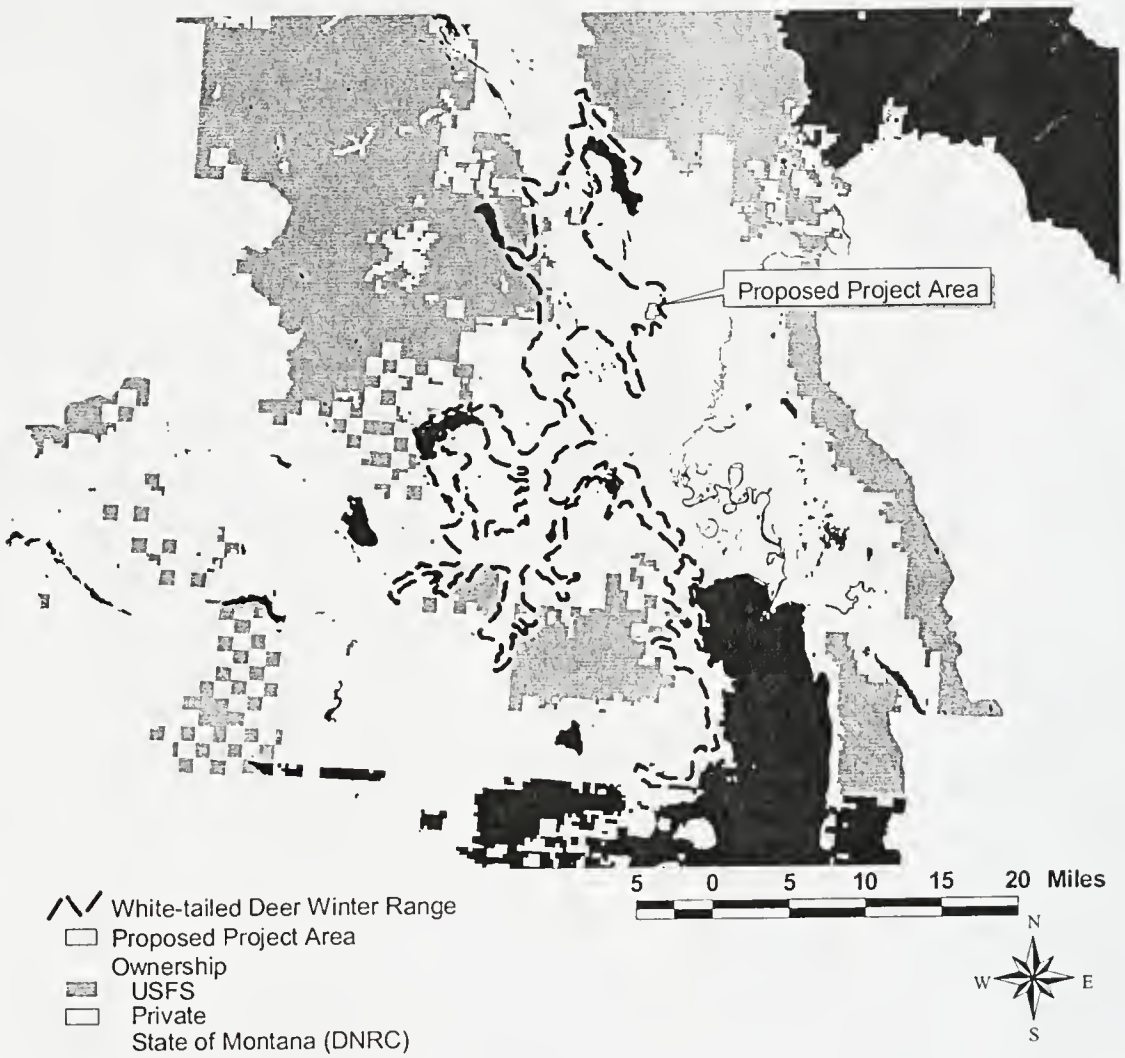

Figure W-2. White-tailed deer winter range in relation to the Happy Valley proposed project area.